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RURAL COMMUNITY
FIRE DEPARTMENTS



THIS BULLETIN presents the summarized results of a field survey of rural fire departments that serve farmers, especially those that concern farmers through ownership or financial interest. Local investigations were made to ascertain the effectiveness of these departments in the reduction of the great fire losses in farming communities and the accompanying social distress.

Eighty rural fire departments were covered. Case studies were made of 52, and information was secured locally concerning 18 others. Indirect but apparently reliable information was received concerning the successful operation of more than a hundred others.

One from each of the several types of fire organizations giving service to farms is described in this bulletin in the hope that any interested community will find at least one type that would suit its conditions.

Although in many places rural fire departments are practically unknown, in other sections they are successfully operating in large numbers. This would seem to indicate that where the successful operation of one such department became known others were soon organized in neighboring communities.

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RURAL COMMUNITY FIRE DEPARTMENTS

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INTRODUCTION

FARMERS AND RURAL PEOPLE of the United States are just discovering the value of fire departments in farming communities. Formerly the attitude toward a farm fire was generally one of fatalism; it was considered one of those things which just happened and about which little could be done. The unfortunate farmer, perhaps already hard pressed for money, lost his house, his barn, or all his buildings, his household effects, perhaps his machinery, grain, and hay, perhaps all his food supplies. A member of his family may have been killed in such a fire—it is estimated that every year 3,500 people on farms lose their lives by fire. The farmer's capital and investment and the accumulations of many years of hard work may have been wiped out in a day. But what could be done about it?

The town fire victim may lose his home or his place of business, but seldom both; the farm fire victim may lose not only his house but the farm buildings, which are the factory of the farm where various farm processes are carried on. After a town-home fire the next-door neighbor often takes in the victims; in farm-home fires the family may find a home far from the farm.

Record books kept by fire departments, in which statistics and information concerning each fire were entered, and the minutes of the meetings of farm fire associations were used in obtaining information about organization and operation and concerning the types of apparatus used, the number and kinds of fires, and the effects of particular farm fires.

In evaluating the effectiveness of rural fire departments, interviews were had with rural fire fighters, rural government officials,

¹ The Chemical Engineering Division of the Bureau of Chemistry and Soils and the farm fire-protection committee of the National Fire Protection Association, whose chairman is connected with the Bureau of Chemistry and Soils, gave counsel in the preparation of this study. Helpful suggestions were contributed by the member of that committee who represents the Division of Agricultural Finance of the Bureau of Agricultural Economics.

members of rural fire associations, and representatives of agricultural interests, and with those who had called upon rural fire departments for help. Inspections were made of the results of many farm building and grain fires that were fought by such fire departments and more than a hundred interviews were held with those who suffered from such fires.

In the 52 case studies, an attempt was made to set forth clearly such factors as organization, method of finance, contractual relationships, social effects and implications, actual operations and results.

Rural changes and improvements of the last dozen years have brought about a change in the attitude of people on farms toward farm fires. Motorized fire apparatus, good roads, rural telephones, farm business associations, and town and country cooperation have

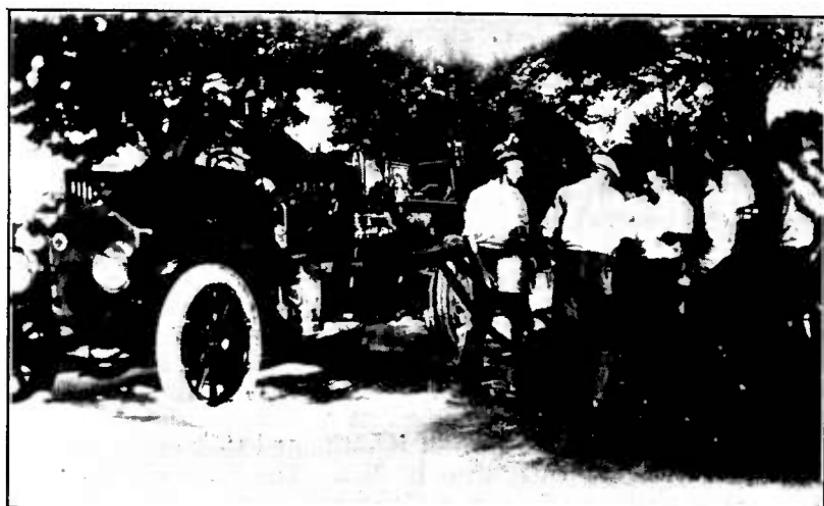


FIGURE 1.—A bucket brigade bringing water to a barrel, from which the suction hose of the Wicomico County, Md., rural fire truck took water to the booster tank of the truck, from which it was forced onto a barn fire at Quantico, Md. The truck had a 9-mile run. The barn burned, but adjacent buildings were saved.

made farm and rural fire departments practicable and advisable.² Distance up to 8 or 10 miles, if roads are good, has ceased to be the most important factor in fighting farm fires. Modern motorized apparatus now leaves a central point, generally in a town, and arrives at a farm fire several miles distant nearly as quickly as city fire equipment leaves its station and arrives, through congested traffic, at an outlying residence fire. The farm telephone starts the fire apparatus on its way almost as quickly as does the city fire alarm.

Rural equipment adapted to motorized fire apparatus is overcoming bad road conditions and limited water supply where such conditions exist. Whether water is plentiful or scarce, the chemical apparatus is useful. Where water is scarce members of farm fire associations are making it available by the construction of outdoor

² "Rural fire departments are now in use in many parts of the country and are very successful." From the pamphlet *The Rural Fire Department*, by the National Fire Waste Council. [Now out of print.]

cisterns, pools, wells, and windmills, the damming of creeks, the transportation of water from near-by farms in milk cans, etc. (Fig. 1.) Rural firemen are displaying remarkable ingenuity in overcoming water deficiency by connecting with windmill tanks, by multiple hose connections, and by arranging relays of fire trucks, etc. Those who give water insufficiency as an insuperable obstacle to the general establishment of rural fire departments are finding their arguments refuted.

Special enabling acts for the establishment of rural fire departments have recently been enacted in a number of States.³ In other States the departments are being established according to existing statutes. Special legislation facilitating the action of departments already organized and legislation removing obstacles to their successful operation are other recent developments. As a result, several hundred successful rural fire departments in which farmers have a

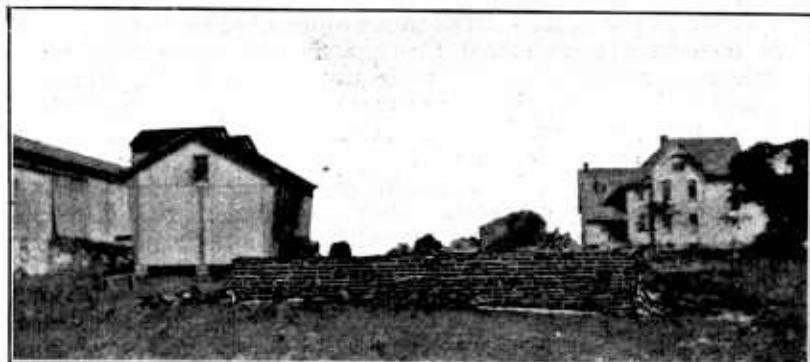


FIGURE 2.—Granary foundation wall left after a fire on the farm of J. C. Lincoln, 5 miles from Medina, Ohio. The fire, fought with the Medina community fire apparatus, was caused by the explosion of a tractor. The close group of seven farm buildings and contents was insured for \$18,000; all would have burned, according to the fire chief, if the fire apparatus had not come. Only the granary burned. The filled corncrib (center) was on fire on both sides when the apparatus arrived. Water to control the fire was secured from a well beside the house.

financial interest, practically all organized within the last dozen years, are now in existence.

In 1925 there were 6,371,640 farms in the United States. The insurable farm property, on the basis of the 1925 census figures, is estimated at \$23,100,000,000. The committee on farm fire protection of the National Fire Protection Association estimates the loss from fires on farms as approximately \$100,000,000 annually. Nearly one-fourth of the national fire loss occurs on farms. These figures do not represent all the loss. Food supplies and productive goods are lost, as are raw materials upon which city industries depend. The farm factory suspends business for a time. Taxable property is lost. Farm families are made homeless. Through social and economic loss it becomes a national problem. The relatively high cost of building material and farm machinery and the introduction of electric machinery and equipment on the farm makes the problem more acute. (Fig. 2.)

³ See Farmers' Bulletin 1643, *Fire Safeguards for the Farm*, pp. 21-22.

Insurance, valuable though it be, is apparently not completely meeting the issue for the farmer. In the final result farmers pay all farm insurance losses, as the insurance company is only the collector and distributor of funds. Many insurance companies object to having a town fire apparatus leave the town, especially if the town is left unprotected, and threaten to raise insurance rates in the town if this is done. The town business man deplores any increase in his insurance rate but often seems to think that the adjacent farmers' fire loss of several thousand dollars is more or less inevitable. Towns find it difficult to refuse apparatus when a farmer calls; many do respond to country calls, even leaving the town unprotected, but town apparatus is not always suited for farm fire fighting or for traveling on country roads. The personnel are not accustomed to country conditions and are seldom trained in farm fire-fighting methods.

Farmers do not pay taxes for town fire apparatus and can hardly expect to depend upon it. Two pieces of apparatus, one for town and one for country, may solve this problem. Fire departments in which farmers are interested through finance, ownership, control, or agreement, which study and understand farm fire-fighting conditions, and which have suitable apparatus for country situations give the most promise toward the solution of the farm-fire problem, according to investigations made.

Insurance companies, in determining town rates, give credit for well-equipped fire departments. They are reluctant to do this, however, in the case of farm fire departments, perhaps because of natural conservatism and perhaps because of a lack of understanding of the effectiveness of such departments. Insurance companies are guardians of the money they handle and must be shown the effectiveness of rural fire departments before credit is given. This development is necessarily slow.

The Fire Underwriters of the Pacific, San Francisco, Calif., have taken an advanced step in this matter. Urged by agricultural extension workers and with the governor of the State manifesting interest, this rating organization is giving credit up to 25 cents per hundred dollars, effective 1929, in the case of insurance on growing grain, to insured farmers in rural fire-protection districts organized according to State law. Recognition was given even to new and untried organizations and equipment that had been graded, and to farmers' fire departments organized under no special fire department law. Of 26 rural fire districts applying for recognition in 1929, 24 were recognized; the other 2 failed to submit the required district maps.

A representative of the underwriters has this to say:

Reports have come to our office of very effective work done by these districts. A superficial investigation shows that, for 1929, there has not been a serious grain loss in any of our rated districts. The possibilities for rural protection are almost infinite and within a comparatively short time I feel that all rural property will be under fire protection. The rating of rural districts is here to stay. While grain fires are the chief problem of California farmers, we are now working on a system of giving credit for rural building fires.

Rural fire departments have ceased to be an experiment and are now advocated by farm organizations, by agricultural extension workers, insurance journals, farm papers, fire prevention periodicals, underwriters' associations, the National Fire Waste Council, the National Fire Protection Association, State industrial and in-

surance commissions, insurance companies, and others who have made an actual study of their effectiveness in meeting the growing farm fire menace.

HOW RURAL FIRE DEPARTMENTS ARE FINANCED

Rural fire departments are financed in various ways.

The principal methods found were (1) governmental, involving direct appropriation, tax levy, or bond issue, through counties, townships, rural fire districts, or towns, or one or more of these combined; (2) public subscription by farmers or townspeople, or both, or the formation of an association and the selling of the stock or charging a membership fee; (3) receipts from entertainments generally given by fire departments; and, (4) farmers' insurance companies, through assessment of policyholders.

Governmental agencies took part in financing 54 of the 80 departments studied. Counties took part in 15, townships in 7, rural fire districts in 18. Los Angeles County, Calif., voted the formation of 28 legal fire districts in unincorporated territory in an area of 184 square miles. These were organized locally, and provided themselves with valuable apparatus, fire departments, and fire houses. The Fremont, Calif., rural fire district, around but not including the village of Mountain View, financed its first-year budget of \$11,000 for 1929, to cover apparatus and maintenance, by a tax of 47 cents on the \$100. The second year, with an 11-cent tax, found the district out of debt and with a surplus. Further annual tax decreases are expected.

Wicomico County, Md., in 1925, appropriated \$6,000 for one county-and-town engine costing \$10,000, to which the town of Salisbury added \$4,000, and \$4,000 to help promote four rural community fire departments. By special act of the Maryland Legislature the county now annually appropriates \$6,000 for assistance, divided equally among eight rural communities, only two of which had apparatus prior to 1925. Four townships appropriated for the apparatus at Chardon, Ohio. As a result of petitions, Hamilton Township, N. J., permitted the formation of nine fire districts.

The 54 governmental appropriations included supplemental appropriations by 20 towns; the apparatus was made available for the towns and, in some instances, was primarily for towns. One township contracts for service from the town of Freehold, N. J. Several villages contract for service from the town of Great Neck, N. Y. Easton, Md., appropriated \$500 toward the country apparatus so that the town apparatus need not leave the town. For the same reason many towns took similar action.

Farmers contributed toward 28 pieces of apparatus, and gave practically all the money for 12 pieces; the average cost of these pieces of apparatus was about \$4,000 each. Townspeople cooperated with farmers in subscribing for 15 pieces and bought 3 pieces without the farmers' aid. In some cases farmer contributions were uniform, about \$25 apiece, and in others they were free-will contributions of varying amounts. The initial contribution usually allowed them free fire service during the life of the truck. The farmers near East Berlin, N. Y., subscribed on the basis of \$4.40 per \$1,000 of assessed valuation of their land. The village of Bas-

com, Ohio (population 401), and the farms around it were divided into three zones, and the inhabitants voluntarily assessed themselves according to the value of their taxable buildings and contents—those in the inner zone 1 per cent, those in the middle zone 0.75 per cent, and those in the outer zone 0.5 per cent. In the 14 square miles of territory, the sets of buildings or "memberships" that entered voluntarily, were 790; only 11 did not enter. The amount of \$12,500 was obtained for a fire house and apparatus.

One farmer near Plainfield, Calif., who owns 1,500 acres, has his own fire truck, and neighboring farmers make arrangements for the use of it.

Fire-department entertainments contributed funds to 10 departments. This was an effective method in the East, especially in Maryland, Virginia, and Pennsylvania. The 1928 carnival week of the fire department of Sharpstown, Md., cleared \$3,200 for the rural apparatus. Carnivals produced \$2,500 for the apparatus at Ashland, Va. Carnivals and moving pictures were most effective in financing and maintaining the department at Bernville, Pa. (See p. 27.)

Farmers' mutual insurance companies frequently contribute to the purchase and maintenance of rural apparatus. The Fall Creek Farmers' Mutual Fire Insurance Co. of Wisconsin, through membership assessment, bought apparatus for \$4,500 and contracted with the local fire department for the latter to serve town and country people. The Farmers Mutual Fire Insurance Co., East Troy, Wis., and the village purchased apparatus jointly.

Townspeople cooperate with farm people in the purchase of apparatus because (1) it often furnishes a second piece of apparatus so that the town is not left unprotected, (2) town interests realize their dependence upon agriculture, and (3) it promotes town and country cooperation.

Taxation is generally considered the most equitable way of financing, since it puts all on a footing of equality in financing and right of service.

TYPES OF RURAL FIRE DEPARTMENTS, WITH EXAMPLES

Brief descriptions are given of a number of rural fire departments, including their origin, cost, kind of apparatus, method of finance, maintenance, ownership, control, kind of organization, operation, and their experiences in fighting farm fires.

On the basis of such factors as origin, ownership, control, finance, organization, and use, five types are found: Farm, fire district, community, township, and county. In most instances the group purchases the apparatus and contracts with a fire company to serve that group. In some instances the group purchases the apparatus and organizes a fire company.

FARM FIRE DEPARTMENTS

In most instances farmers organize a farm fire association, buy apparatus, and contract with an organized town fire company through the town, or with a volunteer company direct, to serve members of the farm association. Farmers who are not members of the association may be served for a fee for each fire. Farmers' associations generally contract with an organized fire company because fire

fighting is a definite business necessitating trained men in a well-organized company, not only to fight fires but to care for specialized apparatus so that it will always be in condition to use.

Some town fire companies in which farmers have no financial interest will fight farm fires in a casual way, but such action is only secondary to the main occupation of fighting fires in town. Farmers have found it to their advantage to finance and own their apparatus, contracting with the town or the town company to house and maintain it and to serve the farmers with it. In return, the town may use the farm apparatus for a town fire if it is not needed at the time for a farm fire. Some farm fire associations organize and control their own companies.

FARMERS COOPERATE WITH A VOLUNTEER FIRE COMPANY, WATERTOWN, MINN.

The Progressive Farmers Club, in 1925, wanted to buy fire apparatus to serve the farmers around this village of 534 people. The village had had a volunteer company for some time but no motorized apparatus.

The farmers' club started propaganda for the purchase of modern motorized apparatus by farmers to be turned over to the village to be used by the village fire company in combating farm and village fires. Committees of farmers were appointed to solicit subscriptions in a territory extending five miles out on each road from the village. Single farms were apportioned \$15; in the case of a rented farm the owner paid half and the renter half. The village commercial club, which included farmers, backed the campaign.

After two weeks' intensive campaign, \$4,118 had been subscribed by 312 farmers, subscriptions ranging from \$7.50 to \$25 each. In addition, the farmers' creamery company gave \$500; village industries interested in agriculture contributed \$1,200 (the canneries \$100, lumber company \$100, shipping association \$500, and telephone company \$500). From the sale of old equipment turned over by the village \$600 was realized. Thus \$6,418 was raised for the new apparatus.

A combination chemical and pumping engine was bought. It has a 6-cylinder, 70-horsepower motor with dual-ignition system. Tires are 36 by 6 inches, and the wheel base is 154 inches. The pump has 30 feet of 4-inch suction hose, two 40-gallon soda and acid chemical tanks with 150 feet of special chemical hose, and two 2½-gallon hand chemical extinguishers. It has a maximum capacity of 450 gallons per minute at a pressure of 120 pounds. Additional equipment consists of ladders, a swinging searchlight, axes, crowbars, poles, etc. Later the town turned over 1,000 feet of hose and two 2½-gallon hand extinguishers for oil fires. (Fig. 3.)

The original apparatus and equipment cost \$5,300. A siren was bought for \$403.75 and connected with the telephone central office, and a switch was put in the town hall. Other expenses were: Travel to apparatus factory, \$10; printing, \$10.75; engine testing by State, \$4.25; labor and material for erecting siren and wiring, \$281.67. Total disbursements from the \$6,418 collected were \$6,010.42; balance, \$407.58. Later the farmers bought other equipment for \$500.

When the apparatus was delivered a public demonstration of its effectiveness was given before a large crowd of farmers and towns-

people. On August 31, 1925, the apparatus was officially turned over to the town at a banquet given in the creamery auditorium by the commercial club to 500 people, including the farmer donors.

The written agreement between the farmers and the village is as follows:

This agreement made and entered into this first day of September, 1925, by and between the duly constituted authorities of the village of Watertown, hereafter called "the party of the first part," and several subscribers to this document, hereafter called "the parties of the second part," witnesseth that for and in consideration of the several sums subscribed herein by the parties of the second part for which they will buy a suitable piece of motor-driven fire apparatus, the party of the first part herein agrees to accept said motor-driven apparatus and keep it in first-class repair and running order at all times, to provide a suitable housing for said equipment, and also provide men to handle same. Party of first part hereby agrees that in case of fire on any property belonging to parties of second part that, being properly notified, the authorities of the village of Watertown will cause the above-men-

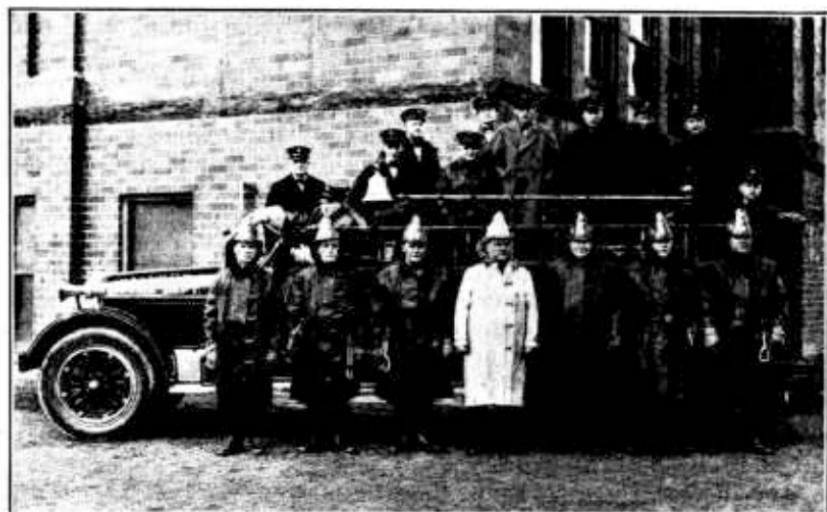


FIGURE 3.—Rural community fire apparatus purchased through the Progressive Farmers Club, Watertown, Minn., and manned by the village fire department

tioned apparatus to go to the relief of the parties of the second part and render all possible assistance toward the extinguishment of the fire and the salvage of the property involved, provided, however, that a fire is not raging at the time in the village of Watertown, and provided also that the apparatus is not responding to an alarm in some other district. Party of the first part agrees to use every possible means to the relief and assistance of parties of the second part but parties of the second part hereby agree not to bring suit for damages against parties of the first part should the truck fail to reach the scene of the fire due to bad roads or other unforeseen conditions over which party of the first part has no control. It is expressly agreed and understood that said apparatus is to be used by the fire-fighting organization of the village of Watertown for the extinguishment of fires in the limits of the village of Watertown and for the several other subscribers called party of the second part.

The agreement is supposed to last during the life of the truck. Thus the town must house, maintain, and man the apparatus and fight farm-member fires, in return for which it may use the truck to fight town fires.

Six farmers have subscribed since the purchase of the truck and others may later. Subscribers get service of the truck free; non-subscribing farmers pay \$45 per hour of service. The village pays its fire company \$1 an hour for each fireman for the first two hours and \$0.50 for each additional hour for answering village calls. This goes into the firemen's equipment fund.

After the truck was bought the volunteer fire company reorganized and solicited new members. Forty-three men applied; 20 became active members and the others reserves, making an available force of 60 men.

The balance on hand in the fire department January 1, 1928, was \$286.81. Receipts for the year 1928 were \$412.40, and disbursements were \$466.70. The balance on hand January 1, 1929, was \$232.51.

During 1928 the department responded to 18 calls—10 from farm subscribers, 6 in the village, and 2 from neighboring villages.

In serving the farmers the apparatus has little trouble with roads, as they are well gravelled. At first there was some trouble getting sufficient water. In four instances several farmers who live near together have built neighborhood cisterns, and two farmers have built individual cisterns near the centers of their building groups.

The value of morale in a volunteer fire company is recognized. At the annual picnic with neighboring firemen competitive games are played; there is an annual dance and occasionally others; social events often follow the regular monthly meetings; and fire-fighting demonstrations are given at neighboring towns. The company is a member of the State and district volunteer firemen's associations and of the State volunteer firemen's benefit association. Delegates are always sent to the State firemen's convention.

Fire officials and farmers expressed satisfaction in the apparatus and the results in suppressing farm fires. The fire chief said:

The arrangement works well and little trouble is encountered in combating farm fires. It is a splendid thing for the farmers. More than the price of the truck was saved at the first few farm fires.

Concerning the Murphy fire, 6 miles from town, at which the chief stated they were handicapped by a lack of water, Ed Murphy said:

Our house fire occurred at midnight when we were all in bed. The department was not called until the house was about one-half burned. The house couldn't be saved but the department and the wind saved all the other buildings. The department did good work. All farmers like it.

FARMERS COOPERATE WITH A PAID FIRE DEPARTMENT, BELVIDERE, ILL.

"I should say not. To charge \$25 for one set of buildings is too much. Never had a fire and probably never will." This was the reported response of one farmer near Belvidere to the request that he subscribe \$25 toward the purchase of a farmers' fire truck and receive free service. But the fire truck was bought by the farmers, and an agreement was made with the town that the town fire department would respond to farm calls. The first call came from the farmer who never had had a fire. After several buildings were on fire and bucket-brigade fire fighting had failed, he decided to call the department, 6 miles away. The farmers' truck responded, and shortly the fire was put out. As the farmer didn't expect a fire he was not supplied with sufficient water. A dam was hurriedly made by

the fire department in a ditch nearly 200 yards away. Although a large barn burned, the intermittent supply of water through the nozzle strainer saved three buildings that were on fire and other property, the value of which was more than the price of the truck.

The second call was also from a nonsubscribing farmer who lost a machine shed, but buildings 15 feet away were saved. Concerning this fire the Rockford Morning Star, April 11, 1929, said: "The farm fire truck purchased by Boone County farmers demonstrated its value a second time last night."

A third call was from a nonsubscribing farmer 6 miles out. Three complete sets of farm buildings were in a close group housing three families. Because of a lack of sufficient water, the stock tanks being empty, an autotruck was used to carry water in milk cans to the fire-truck tank. Although there was a high wind, only a barn was burned.

Concerning this fire, one of the farm occupants said:

There was no way to stop the fire in the barn which was in flames before the truck arrived 10 minutes after I called. The other buildings might have burned if the truck hadn't come. The rural fire department is a very good thing.

The fourth call, also from a nonsubscriber, was at 3 o'clock on a rainy night. Lightning had struck the hog house in a valuable group of farm buildings. Only the hog house burned.

The county agent and the farm bureau were largely instrumental in procuring this truck. The town department had been answering farm calls incidentally. On one of these occasions the apparatus became stuck in the mud, and townspeople protested its use in the country. Country water was dirty and injured the piston pumps of the apparatus which had intakes and outlets that were too large; it had a 750-gallon pump capacity, which is too high for effective country use. The city attorney questioned the legality of using the town apparatus outside the town.

Not wishing to refuse farm calls, the town council ruled that the town apparatus would respond to country calls at \$50 for the first hour and \$25 for each succeeding hour, payment guaranteed by a responsible party.

A meeting of farmers was called, the question was discussed, and the purchase of a farmers' truck was voted. It was decided to raise \$4,500, including \$700 for promotion expense, on the basis of \$25 subscriptions per set of farm buildings, fire service to be free to subscribers during the life of the truck. At this meeting \$800 was subscribed. The town had verbally agreed to house the truck and man it when in action in exchange for emergency use in the town.

Agents of fire-apparatus companies were sent for, the town fire chief was called in, and types of apparatus best adapted to fighting farm fires were thoroughly investigated. Three farm bureau members aided in soliciting subscriptions, but most of the work was done by a paid local solicitor. Soliciting was done in four townships within a 10-mile radius and was concluded in March, 1929, the \$4,500 having been subscribed by 180 rural people, mostly farmers. Other farmers subscribed later.

The fact that many farmers had stock tanks was considered in selecting the type of apparatus. The chosen type cost \$4,200, and was accepted after a test by the town fire chief. It is a combination

pump and chemical truck with a 300-gallon booster tank. It has 30 feet of suction hose with strainer; hose body with capacity of 1,000 feet of hose; two 3-gallon hand chemical tanks with shut-off nozzles; one 60-gallon booster tank with 150 feet of booster hose; 3 search-lights, a siren, and the usual subsidiary equipment. The apparatus was built especially for country use and for handling water from pools or tanks. Dirty water can be used without damaging the apparatus, it is said.

A committee of farmers met the town fire committee to arrange regulations. At first the truck was given by the farmers to the town, but this brought the truck under the provision prohibiting town fire trucks from leaving the town. As the town was willing to operate the truck but did not wish ownership, the truck was returned. To simplify the minor questions of liability for damage to property or injury to persons in connection with the operation of the truck, the farmers found it convenient to incorporate under the State cooperative law for nonprofit organizations and thus retain the truck.

The subscribers formed the Boone County Rural Fire Corporation, the incorporation fee being \$10. Seven directors were elected, and the head office was placed at the county farm bureau office. The only property owned is the fire truck.

Nonsubscribers outside the town must guarantee payments of \$35 for the first hour and \$25 for each succeeding hour for the service of the truck. Receipts from this source are available for needed equipment and maintenance. If the truck should be in use in the town when called to a farm fire, it would have to respond immediately to the farm call. The town has its own trucks. Until July 20, 1930, the truck had not been used in town but had answered 23 rural calls.

The county agent claims the following advantages for country service of the apparatus as compared with ordinary city apparatus: (1) It has a rotary pump that is not hindered by country water. (2) It is standard country width; city apparatus is wider. (3) It has road clearance. (4) It is both light and powerful for pulling through bad roads. (5) Booster-tank capacity is large, consistent with strength and safety. (6) It has large hose capacity, and often more hose is needed than in city fires. (7) It has more lights, including searchlights and spot lights. (8) Truck has regulation hose connection; if no water is available for suction, enough to keep a stream going can be carried by hand to the booster tank and suction can be made from a barrel. (9) Pump has a capacity of 350 gallons of water per minute when wide open but can be cut down to 10 to 15 gallons per minute. (10) It has the needed longer suction hose.

It was recommended that there be only a few solicitors for subscriptions, and that they be trained in rural-apparatus technic, and paid for their work of soliciting.

The town has a population of 7,804. The fire department includes six paid men, and there are four town fire trucks.

FARMERS ESTABLISH A FIRE DEPARTMENT WITH TWO BRANCHES, OAKDALE, CALIF.

The Oakdale Rural Farm Fire Unit, around a village of 1,745 people, resulted from the work of a group of farmers in a grain-and-stock-raising section in which grass and grain fires are a great hazard during the long dry season.

A rule of the town trustees made it difficult for the town apparatus to respond to out-of-town fires. An unsuccessful attempt to solve the problem had been made by the farmers by using an improvised fire truck. Group action had been educative, however, and in 1927 the farmers formed the farm fire unit.

After a study of the equipment needed it was decided to raise \$4,000 to buy apparatus and to operate it one year with a paid driver continually on duty. An assessment of 4 cents per acre was agreed upon; 100,000 acres were included, and the \$4,000 was subscribed by 60 farmers. A number of town business enterprises subscribed \$2,000, making \$6,000 available.

The apparatus first bought consisted of a 2½-ton truck with dual rear tires, carrying 500 gallons of water. On the front of the truck

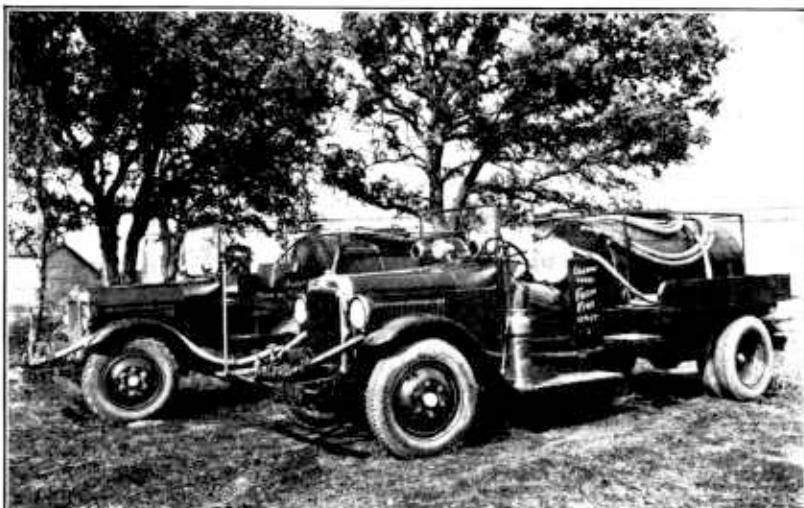


FIGURE 4.—The first two pieces of farmers' fire apparatus purchased and owned by the Oakdale, Calif., Rural Farm Fire Unit. The apparatus is manned at fires by their own fire department.

was a rotary pump running off the motor. Hose racks on each side carried 150 feet of hose and an extra set of hose was carried for building fires. Five knapsack or back pumps each carried 5 gallons of water. Other equipment consisted of three rakes, two shovels, two hand fire extinguishers, a fire torch for back-firing, cans for wet sacks, canteens for drinking water, and first-aid equipment. This truck was installed in Oakdale.

A second similar truck was bought in 1928 and installed on a ranch 18 miles to the south. A worker there has the special duty of operating it. A third similar fire truck was bought in 1929 and installed in town, and the first truck was then placed in another section of the county. The original improvised truck is now a water wagon carrying 300 gallons of water in 10-gallon cans which can be dumped into the tank of a fire truck. The water wagon is used only at large building fires, since this is an irrigation district and all farmers also have stock tanks into which the hose from fire trucks can be plugged. The 500 gallons of water on the truck lasts 2½

miles of fire travel and is sufficient to put out the usual grass or grain fires. It is said to be enough for the average farm-building fire. In case of a large building fire the water wagon can be used, or the assisting farmers can refill the truck tank, by means of hose, from cisterns, pumps, etc. (Fig. 4.)

The fire unit bought 60 back pumps from the State and sold them to individual farmers. These are used to fight small fires, in follow-up work after a fire truck, and to install on harvesters.

The last two fire trucks were bought and one year's maintenance expenses were paid, through an assessment of 3 cents per acre. The only salaries paid are those of the town truck driver at \$110 a month, two country drivers at \$60 a month and board, and the fire chief at \$400 a year.

The department was organized without regard to any particular fire law. The farmers own and operate the fire trucks; the town merely houses one truck in its fire house and allows the use of the electric call system there.

The farmers' truck is used at times in fighting town fires, under the supervision and management of its owners, for which no charges are made. It is claimed that effective work is done at town fires because the farmers' truck driver is the only driver on duty at the fire house and thus makes an early response and because it is not necessary to lay hose before beginning work on the fire.

The farm fire unit elects a board of five directors, each serving a year. A fire chief, who is appointed for a year, is manager of the department and goes to all fires with the driver. On account of the large number of grass and grain fires each year, all farmers are experienced in fighting such fires. When a fire occurs neighboring farmers gather and assist. A town fire brigade is at a great disadvantage in fighting such fires because it lacks the necessary experience and the proper kind of apparatus. Fruit farmers who have small orchards are allowed to become members of the organization at a minimum annual fee of \$5. If they have over 300 acres they are assessed the same amount as are the large ranchers.

The department responded to 57 farm fires during the first 12 months and 48 the second 12 months. During the latter year there were 32 grass and 8 grain fires. Each year there were 10 building fires. The first year 240 acres of grain were lost but only 13 acres the second year. Grass fires are very serious. When one gets well started it may burn several thousand acres of grain. Losses were small in the latter year because experience had enabled the firemen to start quickly and to control the fire before great damage had been done. Efficient early action prevented a number of grain fires from threatening great losses during the long dry season.

This unit is recognized by authorities over the State as being very efficient. It is managed and operated by able and practical men. The Board of Fire Underwriters of the Pacific adopted specifications for a grass and grain fire truck based on the Oakdale farmers' truck.

The only apparent weakness in the system, is its possible lack of permanency as it is a voluntary association not organized and financed by taxation under the State fire district law as are many other rural departments of the State.

One of the sponsors and directors is a banker-farmer who operates a large ranch. He said:

The system is splendid. Our truck can go into a big grain fire with the blaze 7 feet high and put it out as the truck goes along. Our truck went into another district, 18 miles distant, and put out a grain fire in a 1,000-acre field and lost only 15 acres. A man could hardly believe the fires we put out. All the farmers are well pleased.

The fire chief said:

Our system works out 100 per cent. All the farmers are well satisfied. The truck surely does the work. If we had it to do over again we wouldn't make a change. We have been put in class A by the underwriters and have been allowed 25 cents per hundred reduction from the regular rates, on grain insurance. I believe that in five years 300 farm fire trucks will be in operation in California. The first five fires pay for the truck.

The representative of the fire underwriters said:

The people of Oakdale like their system. It is good, but being a subscription rather than a tax system it may not be as permanent. We have reduced the grain insurance rates of these farmers on account of having this truck.

A COUNTY FARMERS' RURAL FIRE PROTECTIVE ASSOCIATION, ADRIAN, MICH.

Various agencies cooperated in the campaign for the purchase of a large fire truck to serve the farmers of Lenawee County. The grange officials, the local farmers' mutual fire insurance company, the county agricultural agent, the town fire chief, the welfare director, and local newspapers, and agents of the apparatus company all took part in promoting the enterprise. Farm fire protection had long been discussed in the local granges which also constituted a fertile field for the later work.

Formerly the town apparatus fought farm fires, but in 1922 this was forbidden. Leaders in the movement spoke in the local grange halls. It was decided to raise \$9,500 by farmer subscriptions—enough to buy a large truck for country and for supplemental town use, and to cover the expenses of the campaign and leave a small balance. After a 3-month campaign during which 900 farm owners had contributed \$9,500, the truck was bought in April, 1925. At the same time the Lenawee County Rural Fire Protective Association was formed and incorporated. New members were to be admitted on payment of from \$20 to \$200. Nonsubscribing farmers were to pay a minimum service fee of \$100.

The large truck was practically made to order to meet the requirements of the fire chief. A committee of farmers and the fire chief visited the factory and inspected the apparatus before delivery. A 5-day demonstration test was made at Adrian before acceptance. A real test was made at an actual farm fire; the owner of the building was so well satisfied that he doubled his subscription.

The truck is a 6-tank chemical; each tank has a capacity of 35 gallons; the tanks are arranged in pairs, and it is possible to refill one pair while the others are working. The truck is equipped with three 200-foot lines of hose, 4 hand extinguishers, 24 extra chemical charges, siren, extension and roof ladders, axes, bars, lanterns, buckets, and mud hooks. It has a 6-cylinder motor of 75 horsepower. This truck was destroyed in a collision while on its way to a fire; the town of Adrian immediately bought a similar one for \$7,000 and gave it to the farmers' association. (Fig. 5.)

The rural fire association elected its own officials, including a grange officer as president, and entered into an agreement with the town of Adrian, renewable annually, regarding the use of the truck. The farmers furnish and own the truck and are responsible for major replacements of damaged parts. The town department must house, care for, and operate the truck, furnish supplies, make minor replacements, give subscribers free service, and may use it for town fires, if precedence is given to country fires. In actual country use, the truck is manned by four town firemen. The apparatus is housed in the town fire house.

The following are the important provisions in the by-laws adopted by the rural fire association:

Article I. Name

SECTION 1. This association shall be known as the Rural Fire Protective Association of Lenawee County and shall be incorporated under Act 84, Public

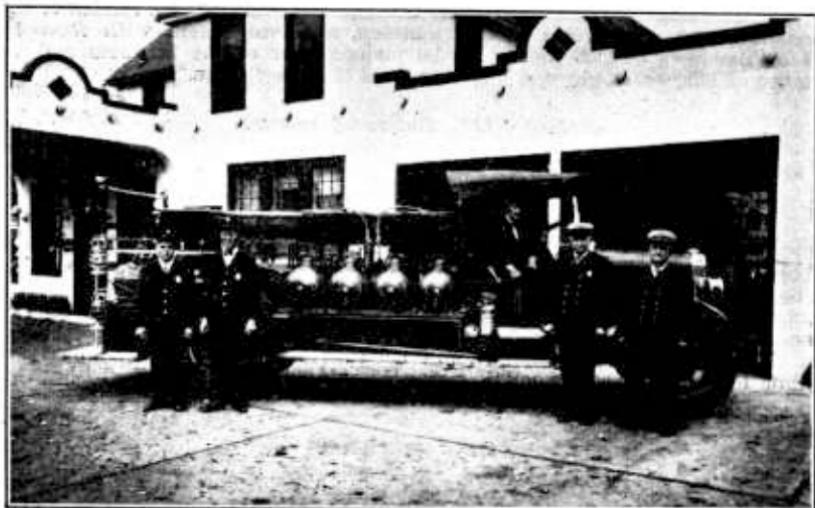


FIGURE 5.—Fire apparatus to serve farmers bought by the Lenawee County Rural Fire Protection Association, Adrian, Mich., which is composed of 900 farmers

Acts of 1921, of the Laws of the State of Michigan, as amended. Its principal office shall be located in the City of Adrian, State of Michigan.

Article II. Objects

SECTION 1. To buy, lease, or rent fire-fighting equipment, to be located in the City of Adrian and to be used for the protection of the property of its members, or others, as hereinafter provided.

SEC. 2. To buy, lease, or rent suitable buildings for the proper housing and care of same.

SEC. 3. The equipment of this association shall not be taken outside of Lenawee County, except by approval by the Board of Directors.

Article III. Membership

SECTION 1. After delivery and acceptance of Fire Truck, membership in this association shall be contributors of not less than \$20 and not more than \$200

and to have paid all assessments for the upkeep and maintenance of the equipment of this association.

SEC. 2. On the receipt of a contribution, the secretary shall issue a certificate of membership. Such certificate of membership shall not be transferable.

Article IV. Fiscal Year

* * * * *

Article V. Meetings

* * * * *

Article VI. Quorum (10 members)

* * * * *

Article VII. Officers

* * * * *

SEC. 5. The Board of Directors shall manage the business and affairs of this association, and make rules and regulations, not inconsistent with these by-laws or the laws of the state, for the management of the business and the guidance of officers, employees, and agents of the association.

Article VIII. Duties of Officers

* * * * *

Article IX. Rights of Members

SECTION 1. Each member of the association shall have only one vote; this shall not be exercised except when all debts and assessments owed by him to the association shall have been fully paid. Voting by proxy shall not be permitted.

SEC. 2. Any member upon written notice to the secretary may withdraw from the association at any time, but such withdrawal shall not affect any right or lien which the association may have against him. Any withdrawal shall be a forfeiture of benefits, right or contributions.

Article X. Audits

* * * * *

Article XI. Charges to Non-Members

SECTION 1. The charges to non-members for the use of the equipment of this association shall be not less than \$100.00 for each call, or as determined hereafter by the Board of Directors.

Article XII. Amendments

* * * * *

Since the truck was bought 32 new subscribers have joined the association. Withdrawals, deaths, and removals left the 1929 membership at 850. The association had a balance in its treasury in 1929 of \$600. It has never had to make an extra assessment. Each of the two previous years it contributed \$100 to the firemen's fund. Difficulty is found at times in collecting fire fees of nonsubscribers. The annual cost of supplies for the truck has been \$150, and total repairs have cost \$100 annually. The town department has 16 paid

men, including the chief. Two men were added when the farmers' truck was bought.

Most of the farmers have telephones, and fire calls are transmitted free. There is a bell in the fire-house tower. Farm fire-call signals differ from town fire-call signals.

During the nine months' use of the truck in 1925 there were 23 farm fire calls; in 1926, 32 calls; in 1927, 28 calls; in 1928, 28 calls; and in 1929, 23 up to October 5. The truck has made an excellent record in saving farm property. If given an early call it usually saves the major portion of the burning building and nearly always the adjacent buildings. The chief is especially energetic in farm fires and in encouraging fire prevention.

Grange and farmers' insurance officials claim an especially low farm-fire insurance rate for the country districts, giving to the truck a share of the credit. The president of the rural fire association put it this way: "Buying this truck has done more good than the truck itself. It keeps down the insurance rate."

The secretary of a farmers' mutual fire insurance company wrote, in response to inquiry:

Officers of this company know that the truck has saved their company thousands of dollars and that during the present depression in land values, when farms are selling for the value of the building—and sometimes less—if it had not been for services of the rural truck we would surely have a higher rate than \$3 per \$1,000 for the last three years.

The secretary of the farmers' association concluded:

After a careful survey of each fire occurring during 1926 and 1927, it was my estimate that the rural fire protection service saved the farmers of Lewanee County \$42,000 worth of property in 1926 and \$26,000 in 1927.

FIRE-DISTRICT FIRE DEPARTMENTS

The demand for farm fire protection and the growth of rural fire departments has resulted in the enactment of laws in a number of States enabling the formation of rural fire districts. Rural fire departments are being organized in a number of States, according to these laws. These districts generally center about a rural village and include farming territory; but they may consist of all the farming territory around, but excluding the village as at Mountain View, Calif., and may include parts of more than one county. They sometimes include several towns. The districts form their own fire departments, although in some cases they may contract for service from a neighboring fire company. The building of fire houses and purchase of apparatus is financed by taxation and the district may borrow money and receive donations.

The departments are generally intended as a solution of the farm fire problem; the primary work of the fire department is fighting farm fires. Among the States that have passed some kind of fire-district law are New Jersey, New York, Illinois, Oregon, Rhode Island, and California. California has made the most progress; 24 of its districts have been recognized by the insurance underwriters and given reductions in grain-insurance rating. Their principal characteristics are organized fire districts, fixed territory, and taxation finance. Their legal form tends to give them permanency. Some have completely organized fire departments, and some have

the nucleus of a department but depend partly on volunteers for fire fighting. The latter are known locally as unorganized departments.

A RURAL FIRE DISTRICT WITH UNORGANIZED FIRE DEPARTMENT, ELK GROVE, CALIF.

The Elk Grove fire district is 8 by 9 miles in dimensions, with an area of 72 square miles. The initial impetus for the organization of this rural fire district, centering in a village of 475 people, was the desire of the chamber of commerce to draw ranchers into its membership.

Ranchers had been suffering great losses from grain fires, which they had been fighting by the usual wet-sack hand method, and they were seeking fire protection. Sixteen members of the chamber went out among the ranchers in May, 1925, primarily on a membership drive, incidentally taking a petition to organize a legal rural fire district. The chamber of commerce gained four new rancher members, and the ranchers and the village people formed a fire district.

The ranchers were practically unanimous for the fire district. Eighty ranchers, representing 40,000 acres, signed the petition, which was presented to the county board of supervisors, who called an election in the proposed district to determine if a district should be formed and a tax levied to purchase and maintain fire-fighting equipment. The election was held on July 3, 1925, and the motion was carried practically unanimously. The board of commissioners of the fire district set the financial requirements for the first year, ending June 30, 1926, at \$4,500. Meanwhile, a petition was received from other ranchers to come in, and 35 more ranchers, representing 19,000 acres, were included in the district.

The district has acquired three pieces of fire apparatus, two stationed at Elk Grove and one at Franklin, 7 miles distant. The principal piece at Elk Grove consists of a pumping engine and a 450-gallon water tank mounted on a substantial truck with dual rear wheels. The pump is driven direct from the transmission. Equipment includes 400 feet of 1½-inch hose, 400 feet of ¾-inch hose, eight 2½-gallon hand extinguishers, searchlight, siren, 4 steel fire rakes, four 5-gallon knapsack pumps, 3 axes, 6 shovels, pipe wrenches, spanners, hose adapters, 1 extension and 1 roof ladder, and a first-aid kit. The second apparatus at Elk Grove consists of a truck with two 45-gallon chemical tanks, 400 feet of 1-inch chemical hose, 2 small hose carts, 1,200 feet of 2½-inch fire hose, and a 24-foot extension ladder. One of the hose carts is attached to the rear of the truck and is instantly detachable. The apparatus at Franklin is a truck with four 35-gallon chemical tanks, 400 feet of 1-inch chemical hose, 1 extension and 1 roof ladder, 4 acid and 4 soda receptacles, and twelve 2½-gallon extinguishers, 2 axes, and 4 shovels. A supply of soda and acid is kept at each station.

The district does not have an organized fire department, as there are few young men in the town. A paid driver and a volunteer fireman at each place do most of the fire fighting, assisted by volunteer helpers.

The district elects four fire commissioners who elect, from among themselves, the usual officers. The commissioners also select a district fire chief. Each driver is paid \$40 per month for the four fire-

hazard months, but they serve the whole year. The pieces of apparatus are employed largely in grass and grain fires but also in building fires. The ranchers have had much experience with grass and grain fires and flock to a fire to assist. The Boy Scouts also help. One good fire fighter to handle the truck and two to handle the hose line are the principal fighters needed. The men stand on the running board and turn on the hose, which can throw a 60-foot stream, while going an average speed of 4 to 5 miles an hour.

The equipped pumping engine at Elk Grove cost \$4,700. The chemical truck cost \$47 for assembling, the parts having been donated. The hose carts with hose cost \$800, making a total cost of \$5,545 for all the fire equipment at Elk Grove. The apparatus is housed in an engine house that cost \$560 to build. The Franklin apparatus cost \$4,500 and is housed in a \$460 building.

All the apparatus was brought through taxation, the district having \$3,333,333 worth of taxable property. The first assessment to cover the first engine and two years' operation and the engine house was 18 cents on a hundred dollars. In 1929 the assessment was 20 cents on the hundred, for the purchase of the Franklin apparatus and one year's operation of all apparatus. This includes all expenses since the district was organized up to the time of this study. The district had no debts and had \$455 on hand August 14, 1929. The assessment for 1930 was 5 cents on \$100, producing \$1,500—more than enough for contemplated expenditures.

The department responded to 133 fires in 1927, to 58 in 1928, and to 74 in 1929. The fires were nearly all rural and were mostly grass and grain fires. Most of the fires occurred during the four summer months of dry weather. Forty-three per cent of the fires in 1929 were outside of the Elk Grove district.

P. B. Smith, who lives 3 miles from town, told of his barn fire:

My fire occurred at 3 o'clock in the morning. The barn was filled with hay. When I saw the fire, the roof and the top of the hay were ablaze. Several buildings, machinery, and a fence soon caught fire. Five minutes after the telephone call the fire truck arrived and only the barn burned. The fire department does extra good work. They have saved thousands of dollars worth of property. No doubt we have saved the insurance companies more money than we have saved ourselves. Taxes are nothing to what that machine has saved. We have as good a chance of saving our house as a house in the suburbs of Sacramento would have from their trucks.

The representative of the fire underwriters said:

This is a good example of a rural fire district with an unorganized fire department. We have allowed these people a decrease from their regular rates in fire insurance rating on growing grain and grass, on account of the formation of this fire district and the good fire-protection work done.

A RURAL FIRE DISTRICT WITH ORGANIZED FIRE DEPARTMENT, ARBUCKLE, CALIF.

The rural fire district at Arbuckle, Calif., is said to have been organized as a result of an implied understanding that if a district were formed and if apparatus acceptable to the underwriters were bought, the underwriters would allow a reduction in fire insurance rates on standing grain. The State school of agriculture had already prepared specifications for such a truck at the request of the underwriters. Both the farmers and the insurance companies had suffered heavy losses and both were looking for relief. The insurance people

believed that the organization of legal rural fire districts would be to their advantage; the farmers wanted insurance reduction and fire protection.

Arbuckle, a town of 1,533 inhabitants, had a volunteer fire company, organized in 1915. They had motorized chemical apparatus, bought in 1915, for fighting grain and grass fires; 50 people, including 25 farmers, had subscribed for its purchase. They concluded that an organized fire district with an organized fire department and modern apparatus, all supported by public taxation, would meet the situation better.

Three farmers and the fire chief conducted the campaign for forming a fire district. At the general election for the formation of such a district, held in November, 1928, the proposition carried, and a petition for such formation was sent to the county supervisors, who approved it January 1, 1929.

The district contains 81 square miles, with Arbuckle approximately in the center. The property valuation was approximately \$4,500,000 in 1929. The crop acreage in the district is about 60,000; grain acreage accounts for 60 per cent and orchards and vineyards cover the remainder.

Water is limited, and this is one of the difficulties in fighting the fires, but many farmers have storage tanks. Water can generally be found within 2 or 3 miles of grain fires.

In August, 1929, the district had three pieces of fire apparatus. The main one was a truck with low gears, carrying 400 gallons of water. Mounted on the truck was a high-pressure pump, driven by a 20-horsepower motor. Other equipment consisted of 200 feet of 1½-inch hose with ½-inch and 5/8-inch nozzles, 400 feet of high-pressure hose with small nozzles, 30 feet of suction hose, 6 knapsack pump tanks, 6 rakes, 6 shovels, wire cutters, electric hand lanterns, searchlight, wire broom, a towline, and first-aid equipment. The second piece of apparatus was a truck with a pump and a 350-gallon tank with somewhat similar equipment. It was used for supplying water to the first, but could be used for a fire direct. The third was a truck equipped with two 40-gallon chemical tanks. It carries 100 gallons of water and a hand-operated force pump. Minor equipment is similar but less than in the case of the others. This truck was used for oil fires or in emergency cases. Each of the three trucks was used for building as well as grain and grass fires.

The first or principal truck was bought May 1, 1920, and cost \$4,662.70, paid for through district taxation. The truck cost \$2,562.70 and the equipment \$2,100. The second and third trucks were old trucks that the Arbuckle fire department had bought through public subscription. The second cost \$1,785 and the third, \$800, excluding some salvaged equipment. It was estimated that maintenance and operating expenses would be \$2,000 the first year.

The first two trucks are housed in the Arbuckle fire house, formerly bought through public subscriptions. The third truck is kept in College City, a village 3½ miles distant. The driver there picks up men on the road as he goes to a fire.

The fire-alarm siren, driven by a 5-horsepower motor, can be heard several miles away. Most farmers have telephones, and alarms can be turned in from any telephone in the district.

The Arbuckle fire department is well organized and now consists of 26 local men, all volunteers. All are unpaid, except the chief, who receives \$150 a month for the five fire-hazard months, although he



FIGURE 6.—Fire department of the Arbuckle, Calif., rural fire district fighting a fire in grain piled outside a local elevator

serves by the year. The district is governed by a board of five directors, all farmers, appointed by the county board of supervisors.

The number of fires attended, from May 1, 1929, when the district truck was bought and the date the hazard season begins, to August 14,



FIGURE 7.—Bags of grain salvaged in the fire shown in Figure 6

1929, was 22. Of these, 11 were grain, 5 grass (generally in grain stubble), 2 buildings, and the others minor grass and fence fires. The largest grain area lost was 25 acres. The largest number of firemen to report for a fire was 25, the smallest 6. About 75 per cent of

all fire calls since the department was organized have come from the country. (Figs. 6 and 7.)

The 25 acres of grain burned was on the Pryor farm 5 miles from town. It was in a field of 1,000 acres, and according to the fire chief, all would have burned if the truck had not gone to it.

The district was one of those in which the insurance underwriters allowed a 25 per cent reduction from the regular rates of 1929 on growing-grain insurance. The assistant fire chief estimated that this would result in a saving of \$13,000 to growers, as compared with what had been paid in previous years.

As to a fire on the West farm, 8 miles from town, Byron Hughes, at the place, said:

The fire department service is wonderful. The truck got here quickly. Mr. West's harvester and 132 sacks of barley burned, but it saved 320 acres of barley of a near neighbor. The fire burned 5 acres of my stubble and would have burned 200 acres if the truck had not come. The stubble is worth \$2 per acre as feed for sheep.

COMMUNITY FIRE DEPARTMENTS

The largest number of fire departments organized to aid farmers come under the classification of community fire departments. In this class, country people and townspeople unite in financing fire departments or pieces of apparatus. In small towns the fire company is often common to both country and town. In larger towns, especially if objection is made to the town apparatus leaving to fight farm fires, one or more pieces of apparatus are bought especially to serve farmers.

In this class the greatest number of methods of financing occur, including combinations of individual voluntary country and town contributions; contributions by farmers' mutual insurance companies, town fire departments, and country and town industries and organizations; town, township, and county appropriations; and receipts from carnivals and entertainments, usually given by fire departments.

The primary aim is fighting country fires. Ownership of apparatus is vested in the town and country fire associations, the town, or the fire company. If the fire apparatus is owned by the town, country people generally have an agreement with the town, preferably written, that the apparatus will also serve country people.

A RURAL FIRE DEPARTMENT FINANCED BY FARM AND VILLAGE SUBSCRIPTIONS, DURAND, ILL.

The Durand Community Fire Department in Illinois is the result of the efforts of a farmer member of the local farmers' fire insurance company and a village dentist. Durand was a typical country village of 549 population without water mains or efficient organized fire protection. As a result of former farm losses, many of which might have been greatly lessened by the use of good equipment, premiums on farm fire insurance were becoming very high.

A proposition before the people of the village to install water mains had been defeated. In 1924 a serious fire in the village burned a church, store, office, and dwelling. The whole village might have burned had not a fire department 20 miles distant come to the rescue.

Shortly after, a farmer lost all his buildings in a fire. In all, about \$75,000 damage was done.

The member of the farm fire insurance company and the village dentist thought that such losses could be prevented or greatly curtailed by an organized local fire department with proper equipment. The village had no funds for the purchase of effective apparatus, so the community fire department was thought of as a means of obtaining apparatus by public subscription, the funds to be solicited from as many farmers as possible.

The village had agreed to house and maintain the apparatus for the use of it within the village. A meeting of leading farmers was called and the idea explained. The farmers were favorable. Officers and a purchasing committee were elected. Other meetings were



FIGURE 8.—Fire apparatus bought by the Durand, Ill., Community Fire Department, composed of 300 farmers and 158 villagers

held, a map was made of the community within a radius of 6 miles and a representative of an apparatus company was called in. The community was divided into six districts, each with a list of property holders, and a solicitor was appointed for each district.

They first set \$6,000 as the amount needed but later decided to buy a second apparatus. Each contributor signed a contract to pay a minimum of \$15 (providing \$6,000 should be raised) and have free fire service during the life of the truck, the town to house and maintain the apparatus according to written agreement. The individual contracts included individual notes which were deposited at the bank, subject to purchase of apparatus.

The total sum needed was finally set at \$10,500. There were \$5,000,000 worth of buildings in the district in need of protection. When \$9,000 had been subscribed the two sponsors signed personal notes for the remaining \$1,500. Later subscriptions with a \$25 mini-

mum repaid this amount. The \$9,000 represented the subscriptions of 300 farmers and 158 village people; 90 per cent of the farmers had subscribed. The total number of subscriptions later reached 500, and subscription lists were closed. A fire fee was agreed upon for those farmers not subscribers, \$35 for the first hour and \$25 for each additional hour.

Two pieces of apparatus, a pumper and a chemical, were bought in June, 1925. (Fig. 8.) The pump and chassis of the pumper were purchased at one factory; the truck was made according to submitted specifications and cost \$6,800, equipped. It has a 16-inch clearance and is equipped with two 70-gallon tanks, a 75-horsepower motor, 1,000 feet of 2½-inch fire hose, 400 feet of 1-inch hose, 30 feet of 4-inch suction hose, 40 feet of 1½-inch suction hose, a 45-foot extension ladder, 12-foot roof ladders, two hand fire extinguishers, nozzles, tips, and similar accessories. The pump was run from the motor that drives the truck.

The pumper throws a stream 110 feet high at the rate of 500 gallons a minute. The capacity can be cut from 500 gallons to 16 gallons per minute so that the water can be forced through the ¼-inch tip of the 1-inch hose and the water thus conserved. There is a large opening into the water tanks and in case there is not a sufficient supply of water at the fire a bucket brigade can be formed to pump water into the opening.

By using the 1½-inch suction hose, water can be taken out of a well or stock tank without stopping the pump. On the recommendation of the fire chief a number of farmers built reservoirs, separate from buildings, in which from 300 to 400 barrels of water, from the eaves or pumps, is always stored.

The second apparatus carried two 45-gallon chemical tanks so arranged that when one tank had been emptied the other tank could be used while the empty one was being recharged. It had 200 feet of chemical hose, ladders, and minor equipment, and a speed of 60 miles per hour. This apparatus cares for the smaller fires and cost \$3,700 equipped.

The town houses the apparatus in a new brick fire house, 24 by 40 feet in dimensions, and keeps a watchman always on hand.

The subscribers organized the Durand Community Fire Department, which owns the equipment, and in 1929 it had over 500 members. The members annually elect a board of trustees and the usual officers. A volunteer fire-fighting company of 28 members was organized and trained. This is an organization of the village of Durand. The village also appoints a fire marshal. Three firemen are trained for each duty; if a fireman is to be away from the town he must notify his substitute. Every man is said to know Shaefer's method of artificial respiration, the fireman's lift, how to carry people down ladders, and how to tie the various knots in ropes needed to do this. They also know something of the science of hydraulics and the friction laws of fire hose.

After each fire a printed slip of 38 questions is filled in by each fireman and is countersigned by the captain. The questions concern the kind of fire, time, cause, how extinguished, kinds of equipment used, amount of damage, names of the firemen, etc.; they concern the care of the apparatus and of each piece of equipment after a fire,

and the preparation of the apparatus for immediate use for the next fire.

A complete fire survey was made of the whole district. A map was prepared and hung in the engine house showing conditions of roads, location of buildings, gates, and water supplies, and other information. A card-index system was installed, listing all subscribers. Each card carries a subscriber's name and a drawing showing the location of buildings, chimneys, oil barrels, and the location and amount of water supply. When the chief goes to a farm fire he carries the card for that set of buildings.

One fire insurance company in another town keeps a renewable amount of money in the treasury of the Durand department to guarantee the expenses of runs made for the benefit of their policyholders, all of whom live outside the zone of the Durand department. This sum of money has been twice exhausted and renewed.

On July 5, 1930, the department had responded to 108 alarms, 102 of which were for fires on farms.

The farmer sponsor and member of the local mutual fire insurance company said:

Previously farm insurance losses had been very high. Premiums every year had amounted to several times what fire protection now costs. The community apparatus has reduced premiums. This would apply to any community with a fire department properly manned.

The other sponsor of the fire department, who has charge of the fire-fighting company, and who has had much experience in a farm fire company and in giving advice to other rural companies made the following recommendations on the general subject.

Before organizing a department and buying rural apparatus it is well to consult officials of organized and successful rural fire departments.

Only such apparatus should be bought as is adapted to rural conditions and to the particular community to be served. The usual city apparatus is not suited in many ways to serve farm fires. Some of the best apparatus companies now make specialized types of rural apparatus.

Before buying apparatus, bids should be obtained from several companies and representatives should be invited to conferences. Careful consideration should be given bids. Many companies have only standard city apparatus.

A \$1,000,000 apparatus, if not properly manned, is not worth much and the apparatus must be continually inspected and kept in good condition.

Fire fighters should be trained, especially in rural conditions; they can be fairly well trained in 30 days' time by instruction, practice, and demonstrations, if several fire runs are included.

A community fire department is useless unless it has an efficient organization and it is necessary, by various means, to keep up the interest of the members of the department.

He concluded: "No investment ever made by any of our subscribers has shown such a net return. The cost is little—the protection worth while."

A RURAL FIRE DEPARTMENT AT BERNVILLE, PA.

Bernville, a village with a population of 302, is the center of a rural community whose "fire company," which includes 322 members and 26 volunteer firemen, owns two pieces of motorized apparatus and a \$40,000 combined fire and community house with moving-picture machines. The fire company and its community house are financed through voluntary efforts of country and townspeople. Free

fire-fighting service is given to the village and to all farmers within a radius of 6 miles.

Bernville Community Fire Company No. 1 was organized in 1920. The officers, elected by the membership, consist of president, vice president, recording secretary, financial secretary, treasurer, 3 trustees, chief, assistant chief, engineer, first and second assistant engineers, 6 nozzlemen, 12 hook-and-ladder men, delegate to the firemen's union, and janitor. All officers serve one year except the trustees, who serve 3 years. The local minister is president of the company, and the secretary was a farmer when elected. The membership fee is \$1 per year.

The fire-fighting team of 26 members has an executive committee of 3 members (consisting of the chief, assistant chief, and ladder chief) and is under the immediate orders of the chief. The apparatus and fire house belong to the company, and in case the company suspends or dissolves, the apparatus reverts to the village, to be turned over to a new community fire company, if such should be organized.

The fire apparatus consists of a 250-gallon pumper with 1,600 feet of 2½-inch hose and a chemical apparatus with dual shifts, two chemical tanks, and 200 feet of hose. (See cover picture.)

The pumper, bought in 1921, cost \$3,900, and the hose cost \$1,600. The chemical outfit, bought in 1922, cost \$680 (the 1-ton chassis cost \$480, the hose \$65, and the tanks were donated). In 1929 a new 1½-ton chassis with 4-wheel brakes was bought for the chemical for \$685, and \$1,100 was spent in overhauling the engines and for purchasing pneumatic tires to replace the solid tires on the pumper. In all, nearly \$9,000 has been spent on apparatus.

The building, owned by the fire company, was built in 1922 as a fire house and community building. (See cover picture.)

The building is a 2-story brick structure, 42 by 120 feet in dimensions, and has a 7-foot basement. It is heated by steam and lighted by electricity. On the first floor is an auditorium, used for community purposes, with chairs seating 396 people, and a large stage. The auditorium is ventilated by two electric exhaust fans, the combined cost of which was \$300. In the rear is a moving-picture booth with asbestos lining. At one side is the fire-apparatus room opening on the street. On the second floor are two large social rooms, a hall 42 by 78 feet, an equipped kitchen, and toilets. The fire house has a bell and a siren, costing \$500, which can be heard a distance of 4 miles.

In 1925 two second-hand moving-picture machines were replaced by two machines that cost \$1,400. An allowance of \$260 was made for the old machines. Good films are bought from the leading film supply companies about one year after their first appearance. The agreement is that the fire company may choose the film; if a poor one should be substituted by the supply company it may be returned.

At first music accompanying the films was furnished by a piano, but in September, 1929, an electrograph with loud speaker was bought for \$700, including 250 double-life records. In the picture booth are two modern projectors, each costing \$700 in 1927.

No charges are made for the use of the social rooms by organizations. The second-floor hall is rented for various uses. The auditorium is used for community occasions without charge.

The two pieces of fire apparatus and the fire-community house were paid for through the usual entertainments, and through voluntary contributions of farm and village people. In financing the fire house the fire company issued \$6,600 in bonds and redeemed them in seven years.

In January, 1930, the only debt was \$400 for the electrograph. There was \$119 in the treasury. Fire service is without cost, but contributions of \$40 or \$50 are sometimes received from those served.

Weekly street carnivals are held during midsummer and weekly indoor fairs are held in the fire house for six weeks during mid-winter. During recent years moving pictures have been taking the place of carnivals and fairs as revenue producers. From 1920 to 1929, inclusive, the profits from outdoor carnivals were \$22,960.73; from indoor fairs, \$9,409.94; and from motion pictures, \$10,083.20.

Over \$2,000 was received through contributions for the purchase of apparatus from some 200 farm and village contributors. Farmers donated labor to the value of \$457 in constructing the fire house.

The operating expenses of the company have averaged \$1,400 a year. Included in the expenses are: Coal, \$336 per year average; electric lights, \$192 per year average; operator of moving picture, \$5 per night; musician, \$4 per night; janitor, \$25 per month; recording secretary, \$50 per year; financial secretary, \$20 per year; treasurer, \$10 per year.

The fire company has a separate voluntary relief association of 156 members, with its own by-laws. The membership fee is \$1.50, and there are no dues. When a member dies each other member must pay \$1 to the relief fund; the deceased member's estate thus receives about \$150. This arrangement is in effect as long as the membership is below 175. Since the association was organized in 1926 it has spent \$1,025 for death benefits involving eight people.

The three townships and the village which comprise the territory of the company are paying about \$90 per year for liability insurance covering its firemen under the State compensation law.

Fire-prevention week is observed each year. During the 1929 week the president of the company gave talks at 12 schools. The company always sends representatives to the county firemen's training school.

The company uses social agencies in maintaining its morale. Its women's auxiliary aids at carnivals and fairs, attends the sick and injured, and organizes social events. An annual banquet with several hundred in attendance is held in the fire hall each winter. Addresses are made, and there are free moving pictures. The preparations for the annual carnivals and fairs serve as an integrating social force. In May and October there are county conventions in rural towns. Delegates are sent to regional and State conventions. The large, well-arranged fire hall and community house is the most effective social instrumentality.

The company instigated the purchase of a 5-acre park which was later turned over to the village. Committees were appointed, subscriptions obtained, entertainments given. A pavilion, a refreshment stand, an artesian well, and roads and bridges were provided. This project cost the community \$5,000 and is paid for.

From 1922 to 1929, inclusive, the company responded to 52 fires. Of 38 of these fires during five years, 28 were on farms; separate figures were not kept during three years. From 4 to 10 firemen accompany the apparatus to fires; from 25 to 50 go in their own automobiles.

Relative to his barn fire, Mr. Kramer, 4½ miles from town, said:

The fire occurred at midday when the workers were in the fields. Children were at the barn playing with matches. Within 20 minutes after the fire was noticed the apparatus had arrived and many firemen were fighting it. The barn, valued at \$4,000, burned, but other buildings 30 feet away were saved. The fire company did very good work.

The pastor president of the fire company was enthusiastic as to the success of this enterprise, and his opinion was representative of the opinions of farm and village people. He thought that perhaps the greatest result was the fine community spirit engendered not only through creating the company, purchasing the apparatus, and erecting the fire house, but through promoting other civic and religious endeavors. There has been an indirect benefit to schools, churches, and other organizations.

Many people who seldom came before come to town to see the moving pictures and enjoy the entertainments in the community house with resultant advantages to local business and organizations. The fire company has taken the lead in the promotion of good roads. The movement for the construction of one 6-mile piece of concrete road costing \$240,000 was originated by the fire company. The community hall was given free for the road meetings.

RURAL FIRE SERVICE FINANCED BY NINE TOWNSHIPS, MEDINA, OHIO

Medina, Ohio, a village of 3,430 inhabitants, is in two townships, and adjoins two others. Its community fire apparatus gives protection to these and seven other townships. If called, the fire company does not hesitate to go outside of these townships.

Supplementing the Medina village apparatus, a small chemical outfit was bought in 1916 through contributions of village and country people; it was used largely in country service. The experience of the chief of the department with this apparatus, which saved considerable farm property, convinced him that much more could be done with better apparatus.

He had been among those who had supposed that a water pumper would not be serviceable in the country because of lack of water. He became convinced that this was not true and determined to obtain a modern pumper. He enlisted the aid of farmers and newspapers. A group of farmers who had been at a farm fire where considerable property was saved by the small chemical, believed that much more could have been saved by better apparatus. They offered to back the chief in his campaign. The chief made a rural speech-making tour, committees were appointed, and farmers and firemen joined in securing subscriptions.

Business men of Medina subscribed, for three reasons: (1) Reduction of farm fire losses would enhance the prosperity of farmers and make them better customers of village business men; (2) good will engendered among the farmers would improve town and country

cooperation to mutual advantage; and (3) village people would have an emergency piece of fire apparatus.

The village firemen realized \$700 from benefit entertainments to obtain money for the community apparatus. Three hundred rural people gave \$3,000. All but two village business men subscribed and \$2,000 was raised. Thus \$5,700 became available.

The apparatus, bought in 1925, is a 400-gallon water pumper equipped with two 40-gallon chemical tanks, 1,200 feet of ordinary hose, 300 feet of chemical hose, 40 feet of suction hose, a 1-gallon chemical extinguisher for electrical fires, two $\frac{1}{2}$ -gallon extinguishers, a $2\frac{1}{2}$ -gallon extinguisher, a 36-foot extension ladder, a 14-foot roof ladder, and the usual accessories, together with clothing for firemen.

There is no written agreement, but it is understood that the community apparatus is under the control of the Medina volunteer fire department. This arrangement was made in order that there might be no restraint in its use for country fires or as subsidiary apparatus for village fires.

There is an understanding that the village will pay the salary of the fire chief, in charge of both town and community apparatus, and the principal maintenance expenses; the fire department is to care for the minor ones. The apparatus is housed with the village apparatus in the village hall. After the pumper was bought the small chemical was sold to another village. From 6 to 10 firemen accompany the apparatus to country fires, for which they receive pay. Others that go are not paid.

To help maintain the apparatus, provide for depreciation, buy new equipment, and pay the service of firemen at rural fires, a charge plan was arranged for rural fire-call service.

The average service charge for farm fires in 1927 was \$52.50.

The Medina volunteer fire department consists of 26 men, including 1 chief and 3 assistants. The chief receives a salary of \$200 per year and the chief engineer, who cares for the apparatus, \$15 per month. All firemen receive pay for service at fires. (Figs. 11 and 12.)

The chief emphasizes training and discipline in the department. Once a month he holds a school for firemen. Fire drills and contests are held regularly in summer. The firemen are divided into fire troops, and each troop is graded on skill, speed, movement, and knowledge of the work, a prize being awarded to the winning troop. As a result 18 men, besides the salaried men, can drive and operate either of the trucks.

An alarm system has been installed at a cost of \$900. In the home of each fireman is a fire bell on a special telephone circuit, and alarms are transmitted through the telephone exchange, the central operator transmitting the name of person, location, road, etc. There is a large fire bell on the fire house that rings different signals for farm and town fires.

The department experiences little difficulty in obtaining water for farm fires. Cisterns, wells, ditches, creeks, and ponds are used. (Figs. 9 and 10.) Water can be pumped 1,200 feet if the apparatus can come within 30 feet of the water. As an experiment in the village, water was taken from a cistern, pumped through 1,000 feet of hose with a pumper to another pumper which was also used as a

booster, and the water was pumped through 1,200 feet more of hose and played on a building. (Figs. 11 and 12.)

The department keeps a careful card-record system of information concerning each fire. An attempt was made to compute the amount

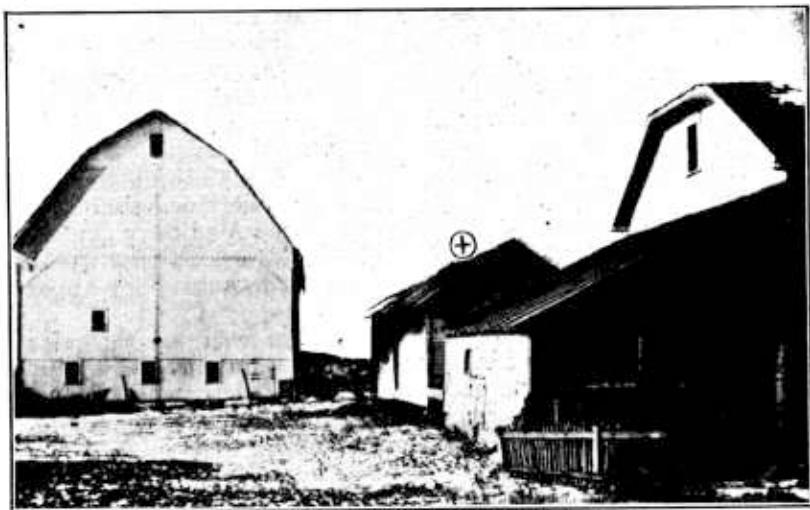


FIGURE 9.—Aftereffects of a fire on the D. Winch farm, 5 miles from Medina, Ohio, fought in below-zero weather by the Medina community fire apparatus. Water was secured from a cistern. Estimated value of buildings saved, including house, \$16,000. Fire damage, \$400. A cross (x) marks the shop building where fire originated

of rural fire losses and the value of property saved in fires for which runs had been made. During 1927, two appraisers, chosen from in-

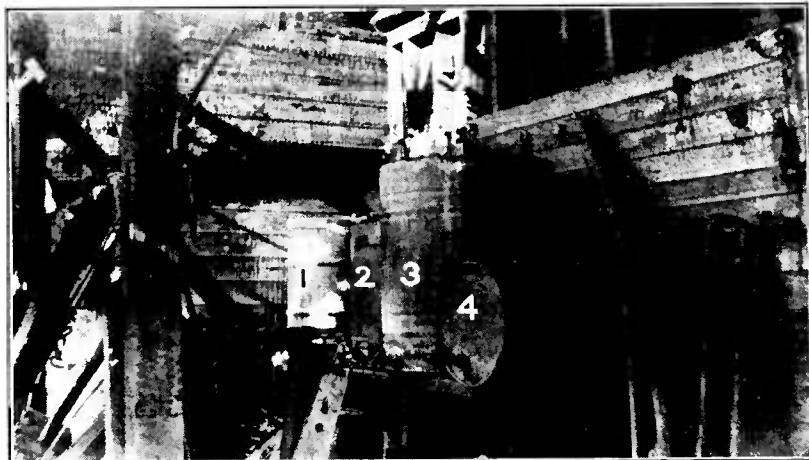


FIGURE 10.—Interior of shop building after the fire (fig. 9) was controlled. Drum No. 1 contained 50 gallons of gasoline; No. 2, 25 gallons of crank-case oil; No. 3, 65 gallons of kerosene; No. 4, 20 gallons of lubricating oil

surance men, contractors, or bystanders, aided the chief in the appraisals of each fire. During that year 45 runs were made to build-

ings endangered by fires on farms or in unprotected villages. The total value of the buildings, exclusive of contents, was \$210,000. The total loss by fire was \$50,000, and the value of the property



FIGURE 11.—After effects of a barn fire at the John Neufeld farm, 5 miles from Medina, Ohio, at 11 p. m. Fire was fought with Medina community fire apparatus. The barn burned, but cornerib (1), granary (2), chicken house, and another building close by were saved.

saved was \$160,000. In 1928 there were 31 runs; the value of the buildings involved was \$85,000, the loss was \$28,000, and the value

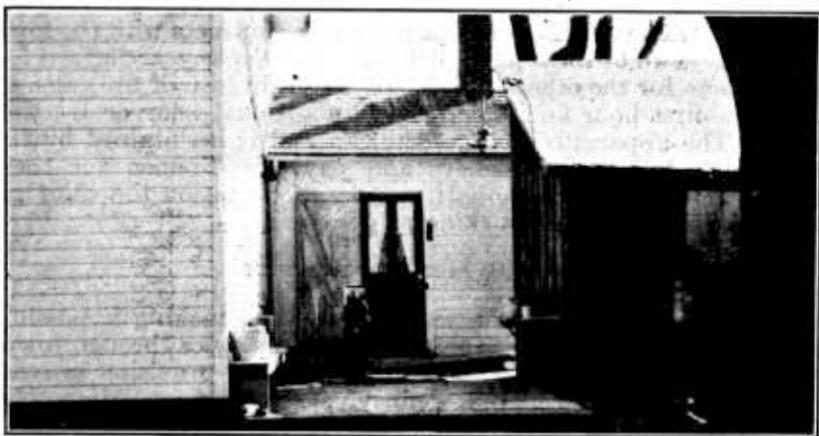


FIGURE 12.—This house caught fire eight times (Fig. 11), but it and adjoining buildings were only slightly damaged. Water to save \$6,500 worth of buildings was secured by attaching 30-foot suction hose to cistern pump seen in this picture.

of the property saved was \$57,000. The number of runs in 1929, up to October 2, had exceeded the total for the whole year of 1928, and the total value of the buildings was higher.

Ed Nettleton, who lives nearly 2 miles from Medina, had a large straw-stack fire in 1927. A barn, insured for \$8,700, including contents and livestock, and a shed were near. A picture of the barn, taken after the fire, shows one side discolored by smoke. One building was partially afire. A rough dirt road leads to the farm. Water was obtained from a creek 300 feet distant. His son stated that the community fire truck, manned by 12 men, arrived in about 5 minutes and fought the fire, remaining for 7 hours; that the barn, shed, and house were saved; and that the fire department did good work.

The county agricultural agent believed that the community fire truck was performing very efficient service.

The chief of the Medina fire department is one of a number of local deputy State fire wardens, and through his experience he has arrived at certain conclusions. (1) In a rural fire organization the most important thing is discipline. (2) Firemen need training. Fighting farm fires consists of more than pouring on water. Water must be conserved and must be properly applied. Success comes in pumping water through a small tip, usually one-half inch or three-fourths inch, on the hose nozzle; it is not the volume of water pumped through that is important, but the driving of the water through at high pressure. (3) If Medina were to buy another community truck a truck with dual tires would be selected, to give better service on country roads, especially in winter. (4) The Medina community fire truck has paid for itself many times over in the property that has been saved.

On January 1, 1930, the status of the truck was changed, to take advantage of a law passed by the last session of the State legislature, providing that township trustees in Ohio may enter into contracts with any municipality for fire protection for their respective townships.

On July 14, 1930, nine townships had made contracts with the town of Medina. Two of these pay a flat rate of \$300 per year for service. The contracts for the others call for payment, in case of fire calls, of \$50 for the first hour and \$25 for each additional hour or fraction thereof. The apparatus answers calls in and is maintained by the town, which collects all moneys and pays the firemen for their services. After six and one-half months of operation the chief reported that the plan was working satisfactorily.

TOWNSHIP FIRE DEPARTMENTS

Laws have been passed in a number of States making it possible for the people of townships to obtain rural fire service through township taxation. Among the States that make this provision in some form are New Jersey, Indiana, Pennsylvania, Michigan, Minnesota, Ohio, Wisconsin, and Iowa.

In some cases the township provides its own apparatus, and fire-fighting companies may be organized. In other cases the township contracts for services with a town or other unit that possesses apparatus and a fire department. Townships join with towns and voluntary town and country subscribers in buying the community apparatus or in contracting for service. Several townships may join together in action in these capacities. The township apparatus may constitute all the fire apparatus in the township, giving service to

farmers and village communities. The township system is considered just and equitable for rural townships.

RURAL FIRE SERVICE FINANCED BY THE RURAL TOWNSHIP OF VERNONTVILLE, MICH.

In 1924 the village of Vermontville, Mich., with a population of 585 people had a volunteer fire company and a small combination hose and chemical apparatus. The company had been accustomed to responding to country fire calls, but as this left the village unprotected it was thought there should be at least one good piece of modern apparatus that would serve the whole township. It was deemed just that the township should finance the apparatus. Farmers compose the majority of the population of the township, which was 1,473, including the inhabitants of the village.

The members of the fire department made a canvass among the country people and found them responsive. A public meeting of

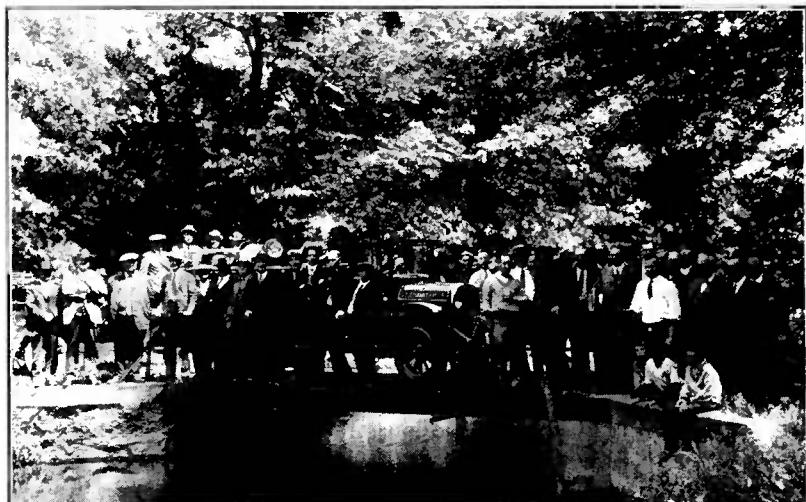


FIGURE 13.—The Vermontville Township fire truck at its delivery demonstration at Vermontville, Mich.

farm and village people was held, at which talks were made by representatives of a neighboring community fire company.

The township board of supervisors, the majority of which were farmers, was then approached, and it voted to put the following proposal to the voters of the township in the form of a special ballot, for decision at the spring election:

Shall the township of Vermontville raise \$4,000 in the year 1925 by a general tax spread on all the taxable property to purchase suitable fire-extinguishing apparatus and equipment for the protection of property against fire, as authorized under act No. 28 of the Public Acts of 1923?

Meanwhile the campaign for the purchase of the apparatus was carried on through newspapers and farm organizations by firemen and leading farmers. During this time there was a serious farm-barn fire. The community fire department from a neighboring town responded to call and rendered good service in saving the property.

At the township election the proposition was favorably carried by a vote of 155 yeas to 53 nays.

Apparatus men were called in, and their bids were studied by the township board and the fire department. The apparatus selected was a water pumper with a 150-gallon booster tank, 200 feet of $\frac{3}{4}$ -inch hose, 500 feet of $1\frac{1}{2}$ -inch hose, and the usual accessories. A deciding reason for selecting this pump was the claim that it could pump dirty water without suffering damage.

The delivery price of the apparatus and equipment, received in 1925, was \$4,100. As \$4,000 was the maximum that could be voted by special election, according to the law, \$100 was voted from the general fund of the township. In September, 1929, the low-pressure pump on the apparatus was turned in to the apparatus company for a new high-pressure pump, \$200 being allowed for the old pump. To complete the \$600 transaction the township paid \$300 and the fire department \$100. (Fig. 13.)

The apparatus is owned by the township. There is a general oral understanding that the village will house and maintain the apparatus and that the fire department will man it, the township to provide needed major equipment and accessories.

The fire company is a volunteer, unpaid organization of 18 men, organized in 1909. The members receive no pay for fire calls, and no charges are made for such calls. The department often receives voluntary donations from those given fire service. One insurance company pays the company \$10 for each run to one of its members, regardless of the work performed. Six firemen accompany the truck to farm fires, and about as many more go by automobile.

The fire company is practically self-supporting. Donations made for fire service rendered and receipts from entertainments provide minor necessities and comforts for the firemen. For the two years ended September, 1929, the sum of \$220 was spent, mostly by the township, for minor equipment and maintenance of apparatus.

The apparatus is housed in the basement of the village and township hall, built a number of years ago, the upper half of which was financed by the township and the lower half by the village. Various methods are used to maintain interest.

Roads are generally good, nearly all being graveled. Some difficulty is experienced with the water supply, which is drawn from wells, cisterns, stock tanks, streams, and ponds. Farmers were told that if they expected good fire service, water must be available. The construction of cisterns some distance from farm buildings was especially advocated. Ten of these, recently built in farmyards, are constructed of concrete and cement with a manhole at the top; each holds from 200 to 300 barrels of water. Water is pumped into them from wells or stock tanks by gasoline engines or windmills. In difficult situations water is brought to the booster tank and propelled to the fire through the $\frac{3}{4}$ -inch hose.

The fire records show 5 country and 7 Vermontville village calls in 1925; 11 country and 4 village calls in 1926; 7 country and 3 village calls in 1927; 9 country and 4 village calls in 1928; 6 country and 7 village calls up to October 21 in 1929. Of the country calls, all except two from other rural villages, came from farms. Of the farm fires, 27 were building, 8 grass, and 3 straw-stack fires. The causes of

the 38 farm fires were listed as: Chimney, 16; grass, 7; lightning, 5; incendiary, 1; unknown, 9.

General commendation was expressed by township and village officials, firemen, and leading farmers as to the township plan of providing fire service to rural communities.

The representative of the insurance company said:

The township truck saves the insurance company a lot of money. Most farmers are members of our company. We appreciate the work done and gladly vote the payment to the fire department for service to our members. The farmers are very well pleased with the fire service. I do not know of any fire company with a better record. It is all a very good thing.

Said L. R. Curtis, farmer, concerning his house fire caused by chimney sparks in 1926 which was fought by 10 firemen using the booster tank:

My house, insured for \$1,200 suffered \$200 damages. The fire department saved my property. I am $2\frac{1}{2}$ miles from town and it didn't seem possible that the truck could get here so quickly. I can't praise the work of the firemen enough.

RURAL FIRE SERVICE FINANCED JOINTLY BY CLAY AND DELAWARE TOWNSHIPS,
CARMEL, IND.

The main street of Carmel, Ind., a village of 598 people, is on the dividing line between the townships of Clay and Delaware. Clay township is 6 miles long by 5 miles wide and has a population of 1,268, including part of Carmel. Delaware township is 7 by 5 miles, with a population of 1,396, including part of Carmel.

The village of Carmel bought a small chemical apparatus in 1921. During the campaign to persuade the people of Carmel to vote for the purchase of the truck, the apparatus company gave a public demonstration of its use in the village. Ballots for and against purchase of the truck had been distributed, and many had been returned. During the demonstration a farm fire occurred; some one took the demonstration truck to this fire and saved considerable property. Farmers then became interested in the possibilities of fire service for farmers, and a number requested the town to buy the apparatus. As a final result, 25 of the 80 people who had voted changed their ballots from No to Yes, and the proposition carried.

The town truck responded to both town and country fires. In 1923 a fire occurred on a farm 7 miles from Carmel. The farmer called the fire company of another and larger town, but it is claimed that permission for the truck to go was refused. The Carmel truck was then called; it responded and saved an 8,000-dollar farm building.

Farmers then began to think that they should have unquestioned fire service. Petitions were circulated to buy apparatus by voluntary contributions of farmers. This was not very successful, as many farmers thought the equitable way would be for the townships to buy the apparatus.

Leading farmers, including officials of the farmers' mutual insurance association, began a campaign to have the two townships buy apparatus. As the village of Carmel would house and be served by the truck the matter was to be decided by the governing boards of the two townships and the village. A joint meeting of the three

governing boards was called to consider the matter, and farmers and insurance officials advocated the proposition. The principal talk made in favor of buying apparatus was by the farmer secretary of the farmers' mutual insurance association who had lost his home (valued at \$8,000) the previous week, partly because the town apparatus was too small. It saved the other buildings. Representatives of apparatus companies attended this meeting. It was decided to buy the apparatus, and the proposition was favorably acted upon at separate meetings of the three boards.

The apparatus, bought in October, 1927, was made according to specifications. It is a chemical truck equipped with six 35-gallon chemical tanks, with three sets of 150-foot hose, each set of hose on



FIGURE. 14—Fire apparatus bought by Clay and Delaware Townships at the Carmel, Ind., garage where it is kept

a battery of two tanks. Thus a continuous stream may be had. The chassis was bought separately and sent to the apparatus factory to be mounted.

The truck cost \$5,250 equipped. To finance the purchase of apparatus, an assessment of taxable property was made in each township of 10 cents on the \$100. This provided \$2,860 for Clay Township and \$3,010 for Delaware Township. In the latter township, across a river and farthest from town and difficult of access for a truck from Carmel, is a village of 142 population. Delaware Township officials decided to withhold \$1,250 of its money for separate apparatus for this village. To make up the balance needed to pay for the townships' truck, the village of Carmel added \$630. When a Carmel taxpayer objected to this with the phrase "double tax" the answer

given was "double protection," as there would be two trucks in the town.

The truck is owned by the two townships and bears the inscription, "Clay and Delaware Townships." One of the considerations impelling the village of Carmel to vote \$650 for the apparatus was an agreement by the two townships to maintain the truck. The village pays the maintenance expenses direct and charges them to the two townships, in proportion to the number of fire runs made in each township.

During the four years the old truck was in use (up to December 31, 1928) the cost of maintaining it was \$321. Donations for specific fire service and by the insurance company for general service in farm fires amounted to \$446. Maintenance expenses of the old truck for 1927 and 1928 and of the new truck from October 7, 1927, to December 31, 1928, was \$773. The assessed valuation for 1928 of Clay and Delaware Townships, respectively, were \$2,990,250 and \$3,113,900, a little larger than in 1927. That of Carmel village, separate, was \$631,270.

The apparatus is housed near the center of the village in a concrete garage, 50 by 132 feet, operated by the fire chief. (Fig. 14.) Eight of the twenty-six stalls are rented to the townships, through the village, for an annual rental fee of \$240. Six of the garage men are members of the fire company and can operate the truck. A lot has been purchased for the location of a new fire house.

Nearly all of the farmers have telephones. In case of a fire the telephone central operator, by special ring, calls the garage where there are several firemen day and night. They man the truck and go to the fire, followed by other firemen in automobiles. There is a large siren on the truck.

The volunteer fire company, organized in 1922, consists of 10 men, including the chief. The only pay they receive is \$1 an hour each for their time on fire runs. Liability insurance is carried on firemen for fire service.

From June 1, 1923, to October 7, 1927, the small village truck responded to 56 fire calls, 30 of which came from the country. Of the 56 fires, 28 were houses, 8 barns, 6 motor vehicles, and 14 were small outbuildings, grass, etc. The total loss reported was a little over \$42,000. Property saved was estimated at \$130,000.

From January 1, 1927, to December 31, 1928, the two town and township trucks had 25 runs, evenly divided as to townships, 1 automobile fire occurring on the dividing line. Seventeen of the fires were in the country. According to the fire-record book, the value of the buildings on fire was \$96,500, the fire loss was \$11,535 and value of property saved was \$84,965. Three of the fires were caused by lightning. It is claimed that in no case has an adjacent building been lost.

Table 1 shows the value of buildings, building fire losses, and distances of buildings from the village, for each fire fought in the country and village by the townships' truck during 1928.

TABLE 1.—*County and village fire statistics for each fire served by the townships' truck in 1928*

Place of fire	Value of building	Fire loss	Distance from village
	Dollars	Dollars	Miles
Farm			
	1,000	5	3
	4,000	5	3
	4,000	4,000	6½
	3,500	2,010	2
	3,600	200	4½
	2,000	200	3
	2,000	10	5½
	4,000	5	6
Total	24,100	6,435	
Carmel village			
	3,500	250	
	2,000	250	
	3,000	300	
	2,000	20	
Total	10,500	820	

In addition there were 7 grass and automobile fires and false alarms. The \$4,000 total loss was a house fire at 9 p. m., 6½ miles from town, caused by chimney sparks. It is reported that the discovery of the fire was delayed and that there was not sufficient water available for the recharging of the chemical tanks. Valuable out-buildings were saved.

The fire company continually advocates fire prevention and the number of fires seems to be decreasing, the number during the year 1929 having been the smallest.

Satisfaction was expressed by farmers, insurance officials, town and township officials, and firemen with the township's truck and the method of financing it.

A farmer, secretary of the farmers' mutual insurance association of Hamilton County and president of the State federation of mutual fire-insurance companies said:

If every township had a truck like ours every rural district would be well protected. This truck can fight fires. I lost an 8,000-dollar house by fire just before this truck was purchased. The old truck came, but it was too small, although it saved some outbuildings. If we had had this truck we would have saved all. Our State federation proposes to arrange meetings over the State in order to persuade all rural districts to get apparatus.

Mrs. Kinzer, on whose farm a fire occurred, said:

Returning from town I discovered the windmill on fire. Several other buildings were blazing on the sides. I started to remove the furniture from the house, but the truck arrived before I had taken out more than a few chairs. Only the windmill burned. The damage was only \$300. The fire company came quickly and did fine work.

In estimating the value of the truck, much emphasis is laid by farmers and insurance officials on a report issued by the Farmers' Mutual Insurance Association of Hamilton County, concerning farm fires in the county in 1928. This report shows that the association had on its books insurance in the county amounting to \$10,798,292, on December 31, 1928 (excluding \$165,685 of reinsurance and short-term insurance which is not subdivided as to townships in the report). Of this total amount of insurance, \$1,970,525 was in Clay and Dela-

ware Townships and \$8,827,767 was in the other seven townships. Thus a little over 18 per cent of the insurance was in the two townships. The total losses paid for the year in the county were \$29,368.38 of which \$27,091.19 were fire losses and \$2,277.19 were lightning losses. The total losses in Clay and Delaware townships were \$427.99, or less than 1½ per cent of the total.

COUNTY FIRE DEPARTMENTS

Taxation is the financial method employed by county units. In one type the county operates its own apparatus and fire-fighting crew to serve rural people and authorizes the formation, according to law, of local rural fire districts, which finance their own apparatus, departments, and fire houses by local taxation, all under the direction of a county fire official as one grand county fire department.

From the standpoint of magnitude of service, Los Angeles County, Calif., is the outstanding example. In addition to apparatus and fire fighters for rural use, the county department includes 35 departments in 28 legal fire districts with locally financed departments, apparatus, and fire houses, involving a rural population in unincorporated territory of 310,345 people. The county department has 150 paid officers and men, most of them uniformed. All of this is exclusive of the county mountain and forestry fire service. It is said to be the third largest fire-fighting organization on the Pacific coast.

Another county type finances the formation of separate rural fire departments and their apparatus and partially finances their annual maintenance. Wicomico County, Md., is an example.

Another type finances rural apparatus and contracts for rural service from one or more town fire departments. Jackson County, Mich., and Napa County, Calif., appropriated \$9,500 and \$4,500, respectively, in 1929 for rural-fire service and contracted with their county-seat towns of similar names for rural service. Davis and Utah Counties in Utah each contract with several towns. Some counties finance county fire departments and apparatus and station them in strategic rural points within the county.

Fire departments financed by counties represent financial equalization and have a basis of reasoned validity and often of special enabling acts.

A COUNTY FINANCES A FIRE DEPARTMENT WITH TWO UNITS FOR RURAL SERVICE, SALT LAKE COUNTY, UTAH

The county fire department was organized in 1921, starting with a small appropriation, to give service to rural people. The county farm bureau was instrumental in persuading the county to enter into rural fire-protective activities as many farmers had been requesting such service. The Salt Lake City fire department does not respond to rural fire calls, except with permission of the mayor or committee of public safety.

The mechanical shops of the county road and bridge department, where 75 men are employed, are located at Murray, population 4,584, about 9 miles from Salt Lake City. The county considered that this would be a good place for headquarters for a county fire department since it was in rural territory near the center of the county,

apparatus could be housed at the shops, and shopmen of mechanical ability there could be invited into the service.

The county has bought the following apparatus: (1) One new chemically equipped truck, capacity 100 gallons per minute, with two hand extinguishers. Designated as the chief's car, it answers calls and makes inspection tours. It cost \$4,500. (2) A water pumper, capacity 750 gallons, with 1,500 feet of 2½-inch hose, 50 gallons of chemical, and 2 hand extinguishers. It cost \$16,500 fully equipped. (3) A combination pumper, capacity 600 gallons per minute, with water tank carrying 500 gallons, equipped with a foam generator, 2 hand extinguishers, 100 pounds of foam powder, 250 feet of chemical hose, and 500 feet of 2½-inch hose. It cost \$10,000. (4) A water pumper, capacity 500 gallons per minute, with 1,000 feet of 2½-inch hose, a 40-gallon chemical tank and 2

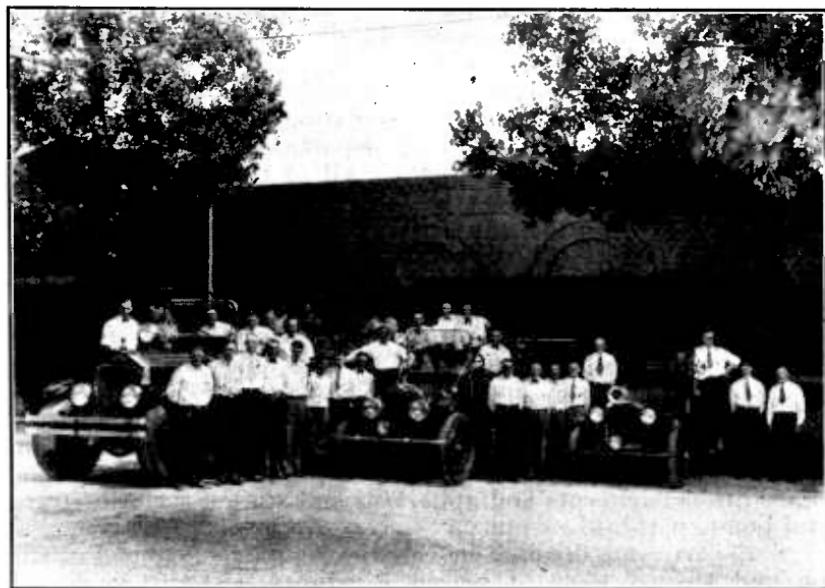


FIGURE 15.—The three pieces of rural fire apparatus purchased by Salt Lake County, Utah, together with county department unit No. 1, in front of the county fire station, No. 1, at Murray. The fourth county truck is stationed at Magna

hand extinguishers. This was bought in 1921 and is fairly modern, equipment having been added gradually. It cost \$12,000.

Three rural trucks are stationed at Murray (fig. 15) and a fourth one at Magna, an unincorporated town, with a population of 1,515, about 12 miles distant. The town of Murray has three pieces of town apparatus. The Magna apparatus serves a territory with a radius of 10 miles. The rest of the county rural territory is served by the Murray apparatus which covers a district extending 6 miles north, 8 miles east, 15 miles south, and 15 miles west. There are several other town fire departments in the county which the county department must assist on call. The county fire department and the Murray town fire departments have reciprocal relationships, but Murray does not assist the county except on call.

County department unit No. 1 at Murray is a volunteer unit consisting of 30 men, of whom 12, including the chief, are county shop employees, the others being employed about town. The chief of the department receives \$160 per month for shop and fire duties and the assistant chief receives 75 cents an hour, mostly for shop service. The captain of unit No. 2 at Magna, which is also a volunteer unit, receives \$50 a month. Each of the men receives \$1.50 the first hour and \$1 each succeeding hour from the county while responding to fire calls. In addition, each man receives a lump sum of \$2 per month from the county for fire service. The majority have been firemen seven or eight years. At Murray, from 12 to 15 men respond to rural fire calls, 3 on the chief's car and the others on other apparatus.

The Murray apparatus is housed in a room, 40 by 30 feet, of the county shop building, a 1-story brick structure. Plans are being made for buying another building for the use of the fire department. The Magna apparatus is housed in a building, 30 by 30 feet, built for fire-department purposes by the county.

The water supply in the county is not entirely adequate, especially in winter. In some places only water from open ditches is available; in some villages and farm districts there are pipe lines with hydrants. Diversified farming is carried on in an irrigation district, and when irrigation ditches are dry not many cisterns are available. Roads are generally good; the main arteries are paved highways, and the rest are of gravel.

Expenses incident to the department in 1929 were provided for according to the following budget:

Maintenance of fire trucks, repairs, labor, and material	\$3,500
New equipment, balance on truck	8,240
Firemen's compensation, 50 men at \$2 a month, 50 men answering calls	7,200
Sundries, unclassified; rent, \$480; light, \$15; water, \$24; equipment, \$1,000; repairs to equipment, \$500; fuel, \$181; total	2,200
Building maintenance, repairs, etc.	500
Total	21,640

It will be noted that \$8,240, to be spent in 1929, was to apply on a truck purchased.

From June 1, 1929, to August 22, 1929, the unit at Murray responded to 32 fire calls. One-half of these were for brush and grass fires, and one-fourth of the remainder were for chicken-house and brooder fires. Two were for residence fires. The total fire damage ranged from \$200 to \$300. During the year July 1, 1928, to June 30, 1929, this unit responded to 123 fires, mostly on farms. The classification of fires was similar to that of the shorter period.

The county fire department is credited with doing effective service for rural people. A member of the board of county commissioners said:

The department gives splendid service. We have received many letters from people who had fires expressing a feeling of gratitude for the good work done by the department. General sentiment and newspaper reports are favorable. The few complaints have been of a minor nature, largely in regard to the location of the apparatus.

The home of Mrs. Hague was threatened by a brush fire, in which from 2 to 3 acres were burned, including 200 big trees. Mrs. Wallace, her sister, stated:

After a boy had tried to put out the fire, we called the department by telephone. It came the 4 miles very promptly and did very good work. Brush fires sweep rapidly in the wind. It was necessary to pump water from a ditch for two or three hours. If the fire department hadn't come the whole country around here, including several houses, would surely have burned.

A COUNTY FINANCES RURAL FIRE SERVICE THROUGH COOPERATION WITH LOGAN,
CACHE COUNTY, UTAH

Logan City and Cache County Fire Department has been in existence since January 1, 1924. Previous to that time it was the Logan Fire Department.

Cache County has an area of 1,164 square miles, a population of 26,992, the population outside of Logan being 17,553.

The Logan Fire Department was not permitted to leave the town except with the permission of the mayor; it was said this limitation was due to the opposition of the insurance underwriters. A few villages of the county had small fire departments for their own service. The Logan Fire Department had many calls from farms but had to refuse assistance. Committees of farmers petitioned the aid of the various farm bureaus, whose officers studied the matter, and the majority of them voted in favor of establishing a county fire department. Farmers appeared before the county commissioners and petitioned for a county fire department.

In the latter part of 1923 the county of Cache and the city of Logan entered into an agreement for one year, effective January 1, 1924, the principal provisions of which are as follows:

(1) The county to purchase 1 triple-combination hose, chemical, and pump truck, with complete equipment, including 2,000 feet of double jacket hose and 2 nozzles, to be under the supervision of the city fire chief. (2) The city to house and maintain the apparatus, in consideration thereof the county to pay the city \$1,500 for the remodeling of the city fire house. (3) The city to employ as its fire department, 7 men at its own expense and 2 additional men at an expense of \$3,000, paid by the county, to be under the supervision of the city fire chief. (4) The apparatus to be used in the service of the city, but the county to have prior right to the service of the triple-combination truck. (5) The city fire department is to use all due diligence in extinguishing fires outside of the city, using as much of its apparatus as may be necessary. (6) All accidents or breakages to any apparatus happening outside of city, while answering calls, to be charged to the county; all maintenance charges to be paid for by the city; all gas and oil charges up to \$120 per year to be paid by the city, but all in excess of \$120 per year to be paid by the county. (7) The county to pay the insurance premiums of 2 firemen, provided for under the workmen's compensation law, and to be relieved of all other accident liability to firemen.

The city also has a similar triple-combination truck, one other combination truck, and a chief's car with hose attached. Four firemen accompany the apparatus to the country if there is no fire in the city; otherwise three go.

The total cost of the county apparatus and equipment was \$13,897.50, payable in annual installments. The 1924 county budget for the fire department was \$3,000, exclusive of the \$3,378.75 installment on the apparatus. The 1925, 1926, and 1927 budgets were each about \$3,200, and the 1928 budget was \$4,435. The 1929 budget included fire prevention, \$125; salaries, \$3,600; extra men, \$820; equipment and repairs, \$900; total, \$5,445. This budget covered department reorganization.

After one year the original contract was renewed in similar form for five years. On January 1, 1930, the contract was renewed for one year with a county budget of \$4,630.

This is an irrigation district and water from the ditches is generally available. Cisterns, ponds, and creeks are also used. One-fourth of the roads are paved, and most of the others are graveled. Farmers' lanes are good except in winter.

In 1928, the department took first place in the State, in the contest of the National Fire Waste Council for fire prevention and protection. An active county fire-prevention campaign is carried on, consisting of the distribution of pamphlets to all schools, fire talks and drills in schools and public places, and the awarding of a flag to the school with the best fire drills and home fire-inspection reports.

Up to November 30, 1929, the department had responded to 151 alarms outside of Logan. The loss from the fires involved was approximately \$87,870; the valuation of the property endangered was approximately \$306,600.

To a number of inquiries concerning the success of the system the responses were uniformly favorable.

The county agent stated:

The farmers wanted the arrangement. I think it is doing very creditable work and is a satisfactory system for this county. Farmers who had fires have commented to me very favorably. I have heard many farmers praise it and no complaints.

The fire chief said:

The protection offered is not only a big thing for the farmer but it also helps the small towns. I believe that the county fire department has saved the citizens, outside of Logan, \$218,730 of property in the six years of its existence.

SUMMARY OF IMPORTANT POINTS

Practice has demonstrated that certain methods of procedure are valuable in the organization of rural fire protection.

Temporary organization.—A temporary organization gives weight to the enterprise. Important groups and organizations in the community are included, such as the farm bureau and the grange.

Laws.—State and local laws are studied to determine under what law, regulation, or method, it is best to proceed. The common non-profit voluntary association law is employed if there is no special law.

Selecting the type.—The examples of successful rural departments presented in this bulletin disclose various types. A type to fit local conditions is decided upon.

Preliminary survey.—Before a campaign is started a survey of the district is made. This includes the area, dimensions, and population of the territory to be included; roads; the terrain and natural barriers, to see if any contemplated part should be excluded; the water supply available or possible; present and future financial resources; and consideration of permanency of the district.

Campaign.—After the type is determined comes a campaign to initiate, follow up, and conclude the enterprise. This involves such things as appointment of committees, public meetings, speeches, securing the cooperation of leading men and organizations, persuasion of the electorate and legislative bodies, solicitation of subscriptions, issuance of fee statements or circulation of stock certificates, etc.

People who have had experience in conducting other campaigns for rural fire departments are called in for advice and assistance. Salesmen of standard apparatus may be invited to assist.

Propaganda.—Publicity is employed to influence favorably the progress and conclusion of the campaign. Local newspapers are used, and the merits of the proposition are clearly set forth. Speeches are made, bills are posted, and circulars are distributed.

The drive for funds.—The drive for funds comes after public opinion has been awakened. The drive is well organized and systematic. Names of the people in the district are secured from tax and telephone lists and are assigned to solicitors, who are leaders in the community, preferably with soliciting experience. The solicitors know something of fire departments and apparatus and can explain the service expected and answer possible objections. Paid solicitors are sometimes the most effective. A fixed sum is generally solicited, but not always. Free fire service is usually promised during the life of the apparatus or a fixed service fee is agreed upon. Subscription blanks are more effective than simple promises. The publication in newspapers of lists of subscriptions is helpful.

Purchase of apparatus.—Great care is exercised in purchase of apparatus. Apparatus from high-grade standard apparatus companies is considered. Some companies specialize in apparatus that is especially adapted to country conditions. Good rural apparatus, suitable for country roads, building height, and water conditions, is available at prices suited to rural financial conditions. Apparatus salesmen who come into rural communities uninvited and solicit subscriptions by high-pressure methods before the way has been prepared, and then quickly depart, are avoided. Good apparatus salesmen have been found valuable in assisting in the campaign.

One valuable practice is to send a competent committee to some other community where apparatus similar to that needed has been in successful operation.⁴

Permanent organization.—Permanent organization comes at the conclusion of the campaign and includes all the subscribers, if it is a voluntary enterprise. Organization tends toward permanency, gives members continued interest, and provides a body which may own the apparatus and whose officers may represent it in contracting for service from town fire department, if need be, or in making regulations regarding the use of the apparatus.

Constitution.—The organization adopts a constitution and by-laws. These provide for regular annual meetings at least, for specially called meetings, and for committees and officials who may operate between meetings.

Contracts, agreements, and regulations.—These relate to the use of the apparatus, especially contracts with towns or other bodies for service. They are put in writing in detail, subject to future change by agreement.

Ownership.—Ownership of apparatus is not to be left in doubt, as complications may arise in the future. A written understanding is needed. Some of the best farmers' associations reserve ownership of

⁴ For technical information concerning apparatus the reader is referred to the report, *Rural Fire Departments, Equipment and Organization*, prepared by the farm fire protection committee of the National Fire Protection Association, 60 Battery March Street, Boston, Mass.

apparatus and contract with towns or fire departments for service. In town and country enterprises ownership may be vested in the community fire association, or in the town or fire department, with a written agreement as to its use for farm fires.

Fire-fighting company.—In a fire department the organization is considered as important as the equipment provided. Responsible officers and trained men are needed. Discipline, pride, and interest in the work, and a good morale are aims of all good fire departments. The personnel receives careful consideration. Local men, energetic and of good physique and moral character, and mechanically inclined, are preferred. Officials are natural leaders and disciplinarians, must know their job well, and merit the respect of their men. Competent officials take good untrained men and make an effective fire-fighting force in a short time, through practice at fires, drills, fire schools, and demonstrations.⁵

Maintenance of interest.—Interest of force and of subscribers is maintained through other community endeavors and through social events both small and large. County, regional, and State fire-department associations are formed, and the meetings are attended by local delegates.

Men and apparatus are not the whole of a fire department. The following factors help to make a department complete and efficient:

Fire house.—A separate building makes better care of the apparatus possible, lends permanency to the organization, and strengthens the morale of firemen. Separate rooms for a meeting place, reading, games, and a lounging place are found in the best buildings. Some have dormitory space for firemen. Some good rural departments are found housed in rented parts of garages and other buildings. Buildings are near the center of the district, and are easily accessible.

Water.—Water is generally available from some source in rural districts. Cisterns, wells, tanks, ditches, streams, ponds, and lakes are used. Where water is insufficient, permanent dams are built; cisterns are constructed separate from buildings; windmills are erected; and neighboring farmers bring water to the fire in milk cans or other receptacles, or they form bucket brigades.

Roads.—Rural fire departments are an inducement for the proper authorities to build good roads. Farmers are encouraged to have good entrances from highways and, under certain conditions, solid foundations for placement of apparatus in their yards.

Telephones.—Farmers in fire districts need telephones to call the departments; many farmers have them. Special arrangements are made with the telephone company to relay farm fire calls, night or day, to the fire house or the homes of firemen.

Alarms.—Special alarm systems to arouse firemen and others are provided at fire houses. The fire apparatus is provided with a siren.

Final surveys.—Fire companies or associations make complete surveys of their districts. The items include the condition of roads, bridges, and farmers' lanes; the location of creeks, lakes, ponds, and rivers; information concerning the number and position of buildings, and the best and most direct road to them, size of water outlets on tanks and reservoirs, location of gates, distance from fire headquarters, and water supply actual and potential.

⁵ For technical information on fire-department organization see footnote 4.

Maps.—Wall maps are made and hung in the fire house, showing the general information indicated by the survey. When a fire call comes a glance at the map reveals necessary information.

Card files.—Detailed information secured concerning each set of buildings is placed on cards. When a fire call comes from a certain building the card may be carried along by the fire chief or firemen.

Fire drills.—Fire drills and demonstrations under varying conditions are held frequently by the company. These help to train the men, sustain their interest and morale, and keep up the interest of the people in the department.

Fire records.—Records of fires fought are kept in books, which can be bought for the purpose. This information includes, for each fire, name and address of owner and of tenant, if there is one; time of call; distance to fire; time occupied at fire and in going and coming; buildings involved; nature of fire; cause; number of men sent; apparatus used; value of each building on fire and of its contents; financial loss on each building; total loss; and the value of property saved.

Inspections.—To insure that apparatus is in shape for any emergency, daily inspections and frequent tests of vital parts are made by competent men.

Training schools.—That firemen may know the various methods of fire fighting under varying conditions and how to operate apparatus, training schools are held. Experts may be called in as teachers. Several colleges now include fire schools in their curriculums.

Relief associations.—Relief associations are organized by some departments on the voluntary-contribution plan for the financial relief of member firemen injured on duty, or for their families in cases of death.

Fire prevention campaigns.—Fire-prevention campaigns are conducted by fire officials throughout the year in schools, churches, and other organizations, and through the press. Moving-picture films have been made and are sometimes used. Such campaigns tend to make property owners more vigilant as to fires, to remove fire hazards, and to reduce the number of fires.